

# Manufacturers Record

SCIENCE AND INDUSTRY

## A \$20,000,000,000 Congress

It is impossible for the average man to conceive of the reasons that prompt the national administration, while asking for tremendous appropriations for necessary national defense, to do nothing about reducing expenditures for unnecessary objectives. The policy of the New Deal from its inception unceasingly has been to spend sums so vast that the mind is staggered by the attempt to comprehend them. And today there is no indication of a change of policy despite the fact that we are face to face with an emergency which demands instead of extravagance, tightening of the belt not only of the individual citizen, but of every governmental agency. The plain fact is we just cannot go on as we are going without meeting financial disaster.

The indications are that this Congress is likely to be a \$20,000,000,000 Congress.

The debt limit, of course, will have to be raised by act of Congress to make it legal, but already it has gone far beyond the \$45,000,000,000 supposed to be the limit the country could afford.

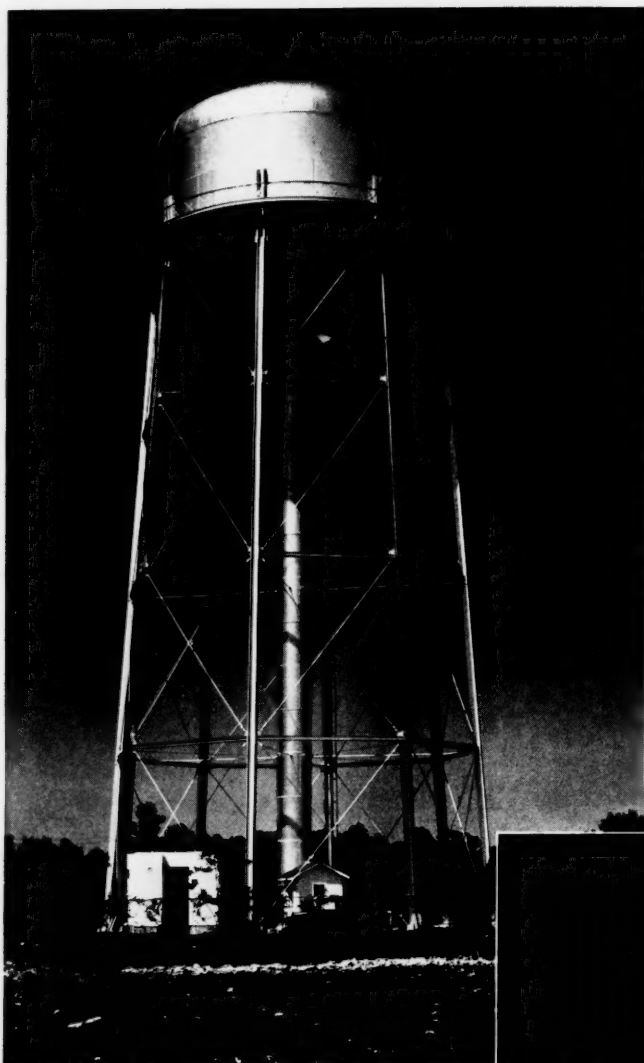
It won't be long at the present rate of spending, if guaranteed obligations which are not counted in the direct debt are taken into account, until \$60,000,000,000 to \$70,000,000,000 will face the country as an obligation to be met.

Is it any wonder that business hesitates and, fearing the future, pauses before adding to plant capacity? Is it any wonder that financial markets see very little prospect of any result from the debacle of spending save that of eventual outright inflation of the currency, or repudiation of the obligation which spells the same thing? That is the prospect, blink it as we may, unless mad spending is stopped.

Whatever the motive, political or not, unless the course is changed the burden of taxation will go on until the point is reached of stagnation and diminishing returns, while prices soar and the value of the dollar will be only a semblance of what it is now. In all of our history there never has been such disregard of the evident vital financial needs of the country. Our affairs have been in the hands of inexperienced tyros who appear as children indulging in a game.

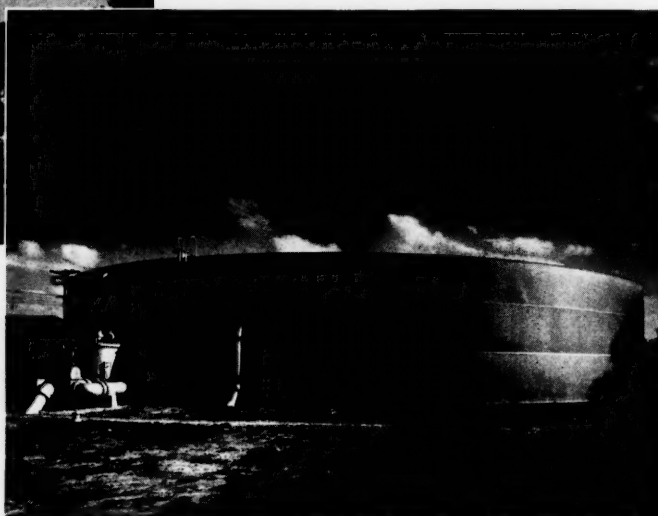
SEPTEMBER 1940





**T**HE flat-bottom steel reservoir at the right is located at one of the City of Houston's seven pumping stations. It is of welded construction throughout.

In addition to elevated and flat-bottom water tanks we are equipped to build storage tanks for all kinds of liquids, pressure tanks, creosoting cylinders, bins, smokestacks, and other steel plate work. Write our nearest office for information or quotations.



● Above, left—A 500,000-gal. ellipsoidal bottom and roof tank, 99½ ft. to bottom, at Houston.

● Above, right—A 2,000,000-gal. welded water tank 130½ ft. in diameter by 20 ft. high.

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B-766

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"All top flooring shall be **MFMA** second grade Maple . . . graded, bundled, and marked in strict accordance with the Grading Rules of the Maple Flooring Manufacturers Association."

. . . So read the flooring specifications for the Shannon Hosiery Mills . . . and so, assured the mill of two things:

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And second, (through specifying **MFMA** trademarked Maple) the assurance of receiving all Northern Hard Maple . . . Maple at its toughest best.

Add **MFMA** to Maple and you get finest quality for mills.

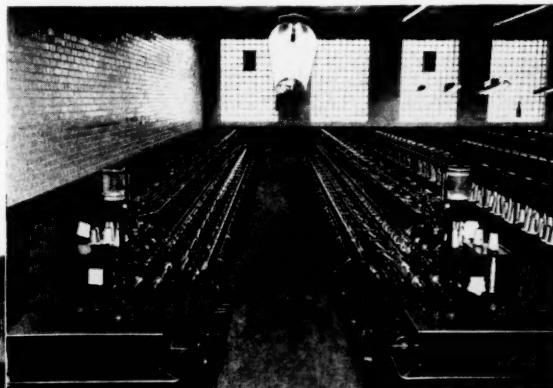
**MAPLE FLOORING MANUFACTURERS ASSOCIATION**

1797 McCormick Building, Chicago, Illinois

See our catalog data in Sweet's, Sec. 11/78. Write for leaflet on heavy-duty finishes for old or new floors.

**Says N. S. ILLGES, President**  
**Shannon Hosiery Mills, Inc., Columbus, Ga.**

*Below, the Knitting Room of the Shannon Mills, and at left, the looping, seaming, and grey inspection departments — both floored with **MFMA** (Northern Hard) Maple. J. E. Sirrine & Company, Greenville, S. C., were the Engineers.*



Floor with **MFMA** Maple  
REG. U. S. PAT. OFF.  
(N O R T H E R N   H A R D)

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*Pressure Creosoted*  
**PILES • TIMBER**

*Used for*  
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LONG LIFE  
RELIABILITY...**

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ADDRESS INQUIRIES TO CHICAGO, ILL., OR LOUISVILLE, KY.



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### MANUFACTURERS RECORD

Devoted to the Upbuilding of the Nation Through the Development of the South and Southwest as the Nation's Greatest Material Asset

Published Monthly by the  
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FRANK GOULD, President

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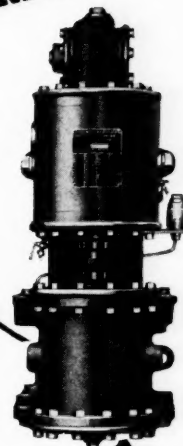
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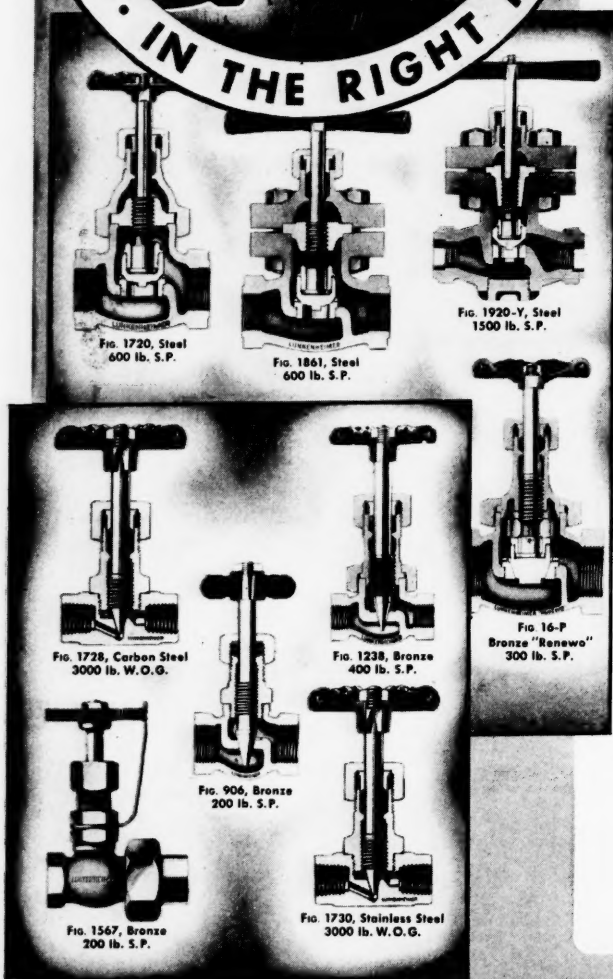
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for INSTRUMENT LINES,  
DRAINS AND BY-PASSES

... ARE "CORRECTLY ENGINEERED" FOR  
MAXIMUM ECONOMY ON THE JOB!



Behind the super-sensitive instruments which guide today's engineer in his constant search for ever-greater operating efficiency and lower operating costs are mazes of pipe lines through which the flow of liquids and gases must be accurately controlled at all times. For such service, only valves of the finest design, materials, and workmanship are worthy of their hire... so, it is natural that Lunkenheim should pay special attention to the production of throttling and needle point valves for every instrument line, drain, and by-pass requirement.

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MANUFACTURERS RECORD FOR

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SEPTEMBER NINETEEN FORTY





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**Builders of**  
**HYDRAULIC TURBINES:**

**Francis**

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**(Fixed and Automatically  
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**NEWPORT NEWS, VIRGINIA**

WATER IN THE  
and cells in g  
helps growth  
decay. Green  
is 25 pounds

WOOD PRES  
equipped to c  
these method

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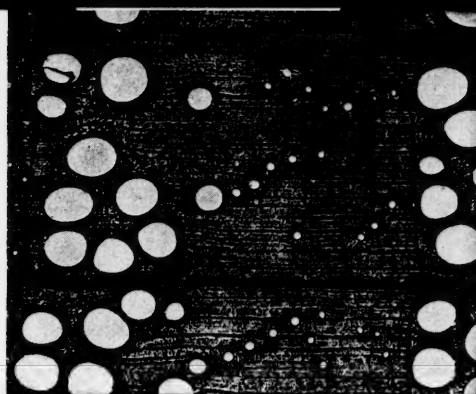
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## PRESSURE-TREATED TIMBER PAYS FOR ITSELF . . .



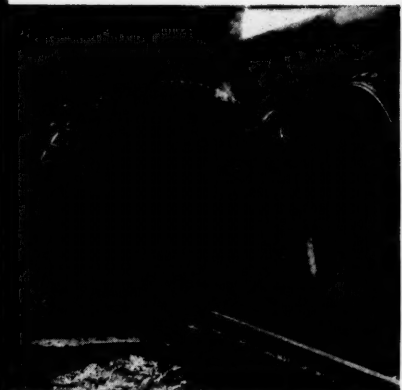
**WATER IN THE FORM OF SAP** fills the fibers and cells in green timber. In a live tree it helps growth; in cut timber it promotes decay. Green timber may contain as much as 25 pounds of water per cubic foot.



**REMOVAL OF MOST OF THE WATER** is the first step in preparing timber for preservative treatment.



**AIR SEASONING** is the best method of conditioning or drying wood for pressure treatment. Ample stocks of W.P.C. timbers are dried in ventilated stacks in clean, well-drained yards under careful control and supervision for future use.



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**CREOSOTE IS THEN APPLIED** under pressure and thoroughly penetrates the fibers of the wood. Timber treated in this manner is protected against decay and insect and marine borer attack.

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## IN CASE YOU THINK THIS IS ONLY A CHAIR...

You don't know the half of it!

It is really a mobile device designed to save the energy of people who think in a sitting position.

People like yourself.

Name just one device in your business that is more on the move than your own office chair. It is dragged, shoved, lifted, turned, hitched, wiggled, swayed. And that spells mass-in-motion, even if the speed is slower than an airplane, and the power has to be provided by your own various and sundry biceps.

Aluminum makes *this* chair light. It is fashioned ingeniously out of strong alloys of Alcoa Aluminum. Its maker designs it for comfort, welds it into sturdy one-piece construction that says good-bye

to ordinary maintenance. He enhances the natural beauty of aluminum with lovely surface finishes, adds clever adjustable features, and gives you a chair you'll never want to part with.

All of which starts with the fundamental principle that whatever moves or has to be moved is better, when built light and strong out of alloys of Alcoa Aluminum.

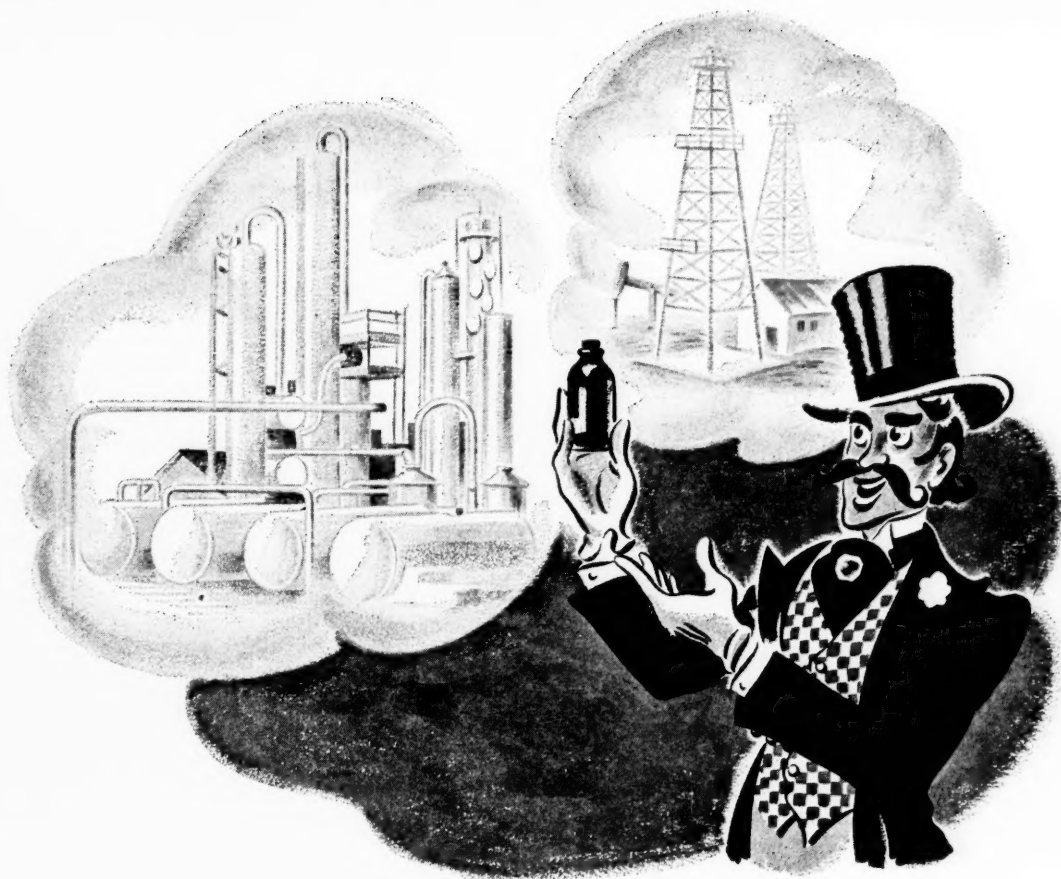
Light things move easier, faster, cheaper. Making things light is *the* profitable principle in design. And Alcoa Aluminum is *the* economical material to use for lightness with strength.

Our know-how is at your disposal. Aluminum Company of America, 2109 Gulf Bldg., Pittsburgh, Pa.



# ALCOA · ALUMINUM





## **... and the cure-all became a billion dollar industry**

Petroleum was first introduced to the general American public as a medicine to cure a host of ills.

It was sold at Saturday night medicine shows by slick gentlemen in frock-coats who claimed it to be the discovery of the ages. And so it was. From this humble beginning as bottled black magic, crude oil grew into the billion dollar oil industry of today.

The Southern States with their great fields and reserves produce more oil than all the other states combined. It is only natural, therefore, that the South has become a factor of world importance in oil refining and the manufacturing of petroleum by-products.

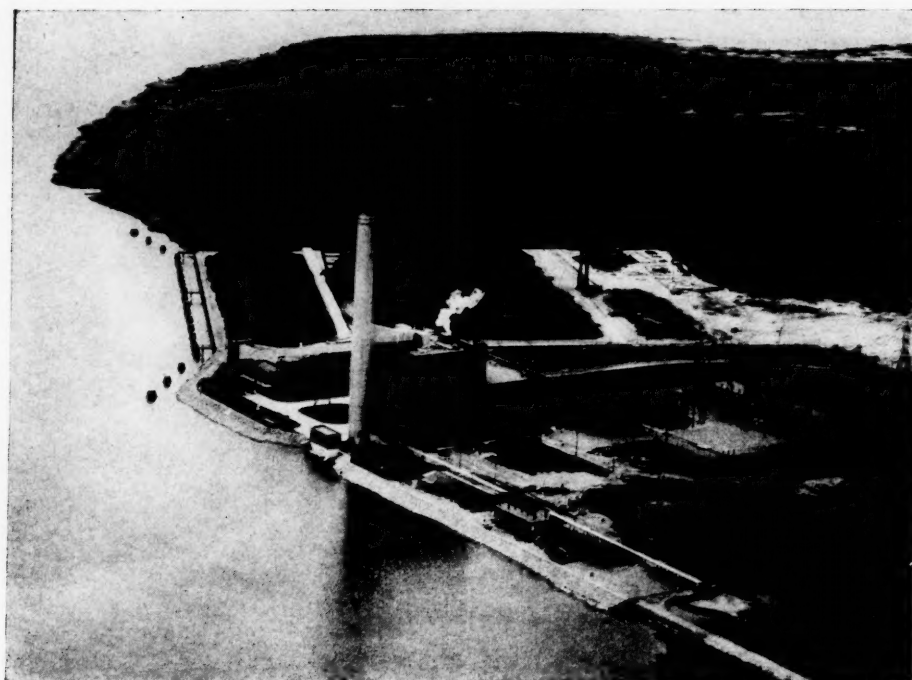
The petroleum industry requires steel in many forms for its growth and maintenance. Bethlehem manufactures many of these steel products, such as: well-head fittings, pumping units, tubular products, sucker rods, Christmas trees, wire rope and strand, storage tanks, structural steel and tank plate. With 33 Bethlehem Supply Company stores located at strategic points throughout the major oil producing fields and Bethlehem's plant on tidewater at Sparrows Point, Maryland, this company is excellently situated to furnish steel promptly and economically to the Southern petroleum and other Dixie industries.



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John C. Weadock  
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- As a customer of a company in the Commonwealth and Southern system, you have available the free services of our power, heating and lighting engineering departments. These trained organizations are at your call in all matters relating to uses and applications of the company services in your operations.

**T**HE Commonwealth & Southern system programs its work to build ahead and stay ahead of public needs for light, heat and power.

At the present time, for example, steam-electric generating capacity newly installed, projected, or under construction is adding approximately a half-million horsepower to the millions of electrical horsepower now on 24-hour duty.

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Burroughs makes available to every line of business information about new Burroughs machines and developments, and their application to current accounting problems.

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☐ I should like complete information immediately applying to \_\_\_\_\_

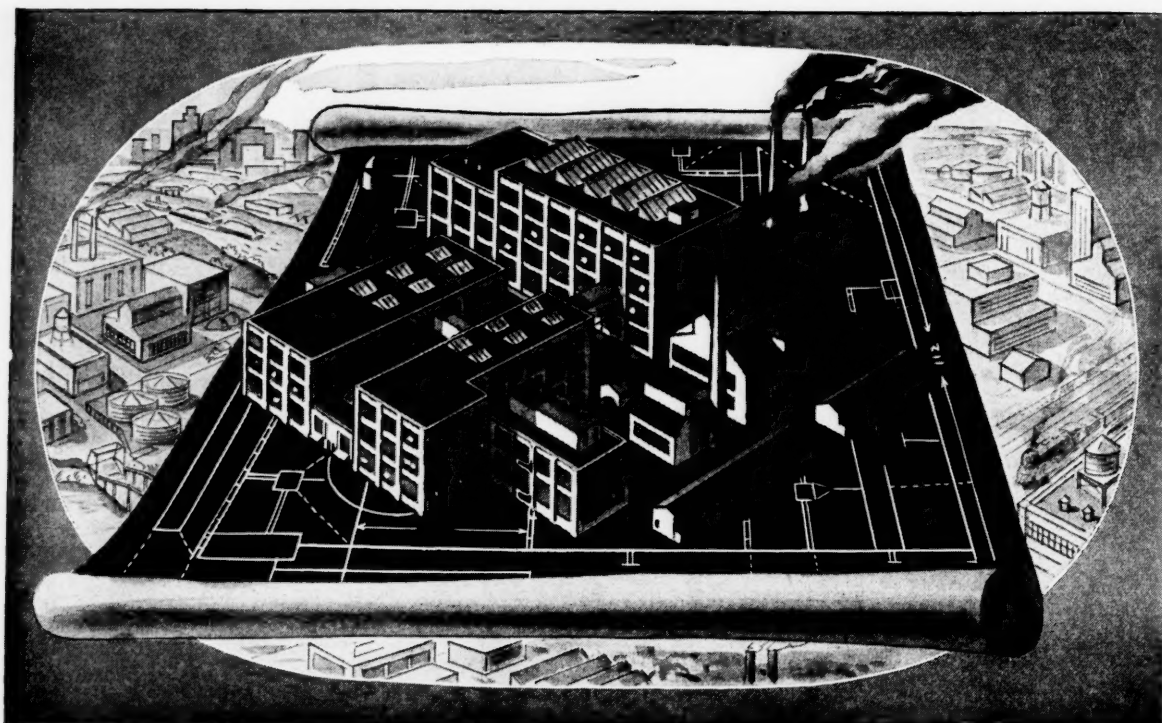
☐ Please place the following name on your list to receive information about new Burroughs developments.

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## BEFORE YOU BUILD— OR EXPAND YOUR PRESENT PLANT, GET THESE FACTS ABOUT THE ADVANTAGES OF ILLINOIS



The factors which make possible profitable operations for many industries in Illinois may make this State the logical location for your new plant, branch plant, warehouse, or distributing center. Illinois is the "business cross-roads" of the Nation, closer to the center of population, center of industry, center of agriculture, geographical center and sources of more raw materials than any other industrial State. You can improve your service and cut production and distribution costs in Illinois.

Investigate the **ADDED PROFIT POSSIBILITIES** of a plant or branch plant in Illinois, where you pay **NO State Income Tax, NO State Machinery Tax, and NO State Real Estate Tax.**

### Special Confidential Report for Executives

Write the Illinois Development Council in Springfield, today, for detailed information on the labor and raw material supply, transportation and power facilities, fuel and water, housing facilities, and available buildings and plant-sites, as they apply to your business.

In order that a truly practical and informative report may be submitted to you, include full information about your manufacturing needs. Your inquiry will, of course, be kept strictly confidential. Write—

**ILLINOIS DEVELOPMENT COUNCIL**  
**STATE HOUSE • SPRINGFIELD, ILLINOIS**

## FACTS

**MARKETS.** Illinois is the center of the huge Middle West Market, with 50,000,000 population within overnight shipping radius.

**EQUIPMENT.** Illinois is the second largest metal-working State of the Nation, assuring manufacturers located here of adequate stocks and rapid deliveries of machines, tools, parts.

**LABOR.** A large labor supply, noted for its stability, and skilled in a wide variety of trades and occupations.

**POWER.** Power facilities ample for today's needs and geared to tomorrow's requirements, serve all Illinois in a vast interlocking system.

**TRANSPORTATION.** Illinois is the hub of rail and air transportation, and has the finest highway system in the Nation. Many important manufacturing centers are served by both the Lakes-to-the-Gulf Waterway, and the Great Lakes-St. Lawrence Waterway.

**FUEL.** Illinois is the third State in the Union in bituminous coal production and third in oil production, assuring ample fuel supplies at low transportation cost.

**WATER.** Abundant water supplies are available from eight great drainage basins in Illinois. Analyses showing flow of surface waters, underground supplies, and mineral content of water for any locality can be obtained on request.

# ILLINOIS

**THE STATE OF BALANCED ADVANTAGES**

# THE SOUTH FOR INCREASED SALES VOLUME AND PROFIT

Fourteen Southern and border states, possessing 28% of the total population of the United States, today contribute 51% of the population increase. Contrary to popular impressions, the Southern White is increasing much faster than the Southern Negro. Unless the trend of industry and population reverses itself, the South is destined to become more important both politically and economically, and will hold the hot future markets for American manufacturers.—Interview with Gen. R. E. Wood, Chairman, Sears, Roebuck & Company, in FORBES.



## WE, THE GOVERNORS...

Of the Southern states invite the nation's industrial leaders to study our section as ideal for profitable manufacture and distribution. A mild, year-round climate,

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## Southern Governors' Conference

Bona Allen Building, Atlanta, Georgia

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**Dredging—Construction—Engineering**  
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**Commercial Slag**

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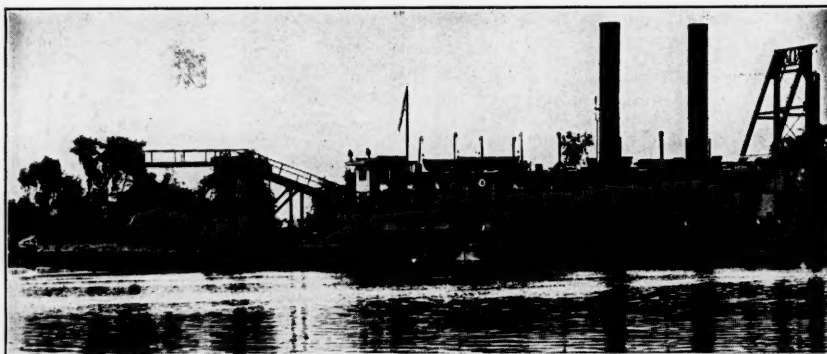
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 Correspondence invited from corporate and private interests everywhere.

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**M**EN AT WORK constructing a cast iron line are building for the ages. Generations yet unborn will benefit from their labors and the long life of cast iron pipe. In recent years, with laying methods and pipe manufacturing processes have been materially improved. The service to be counted on from properly laid U. S. pit cast pipe or U. S. Super-de Lavaud *chilled* centrifugally cast pipe is greater than ever.

# U.S. cast iron PIPE

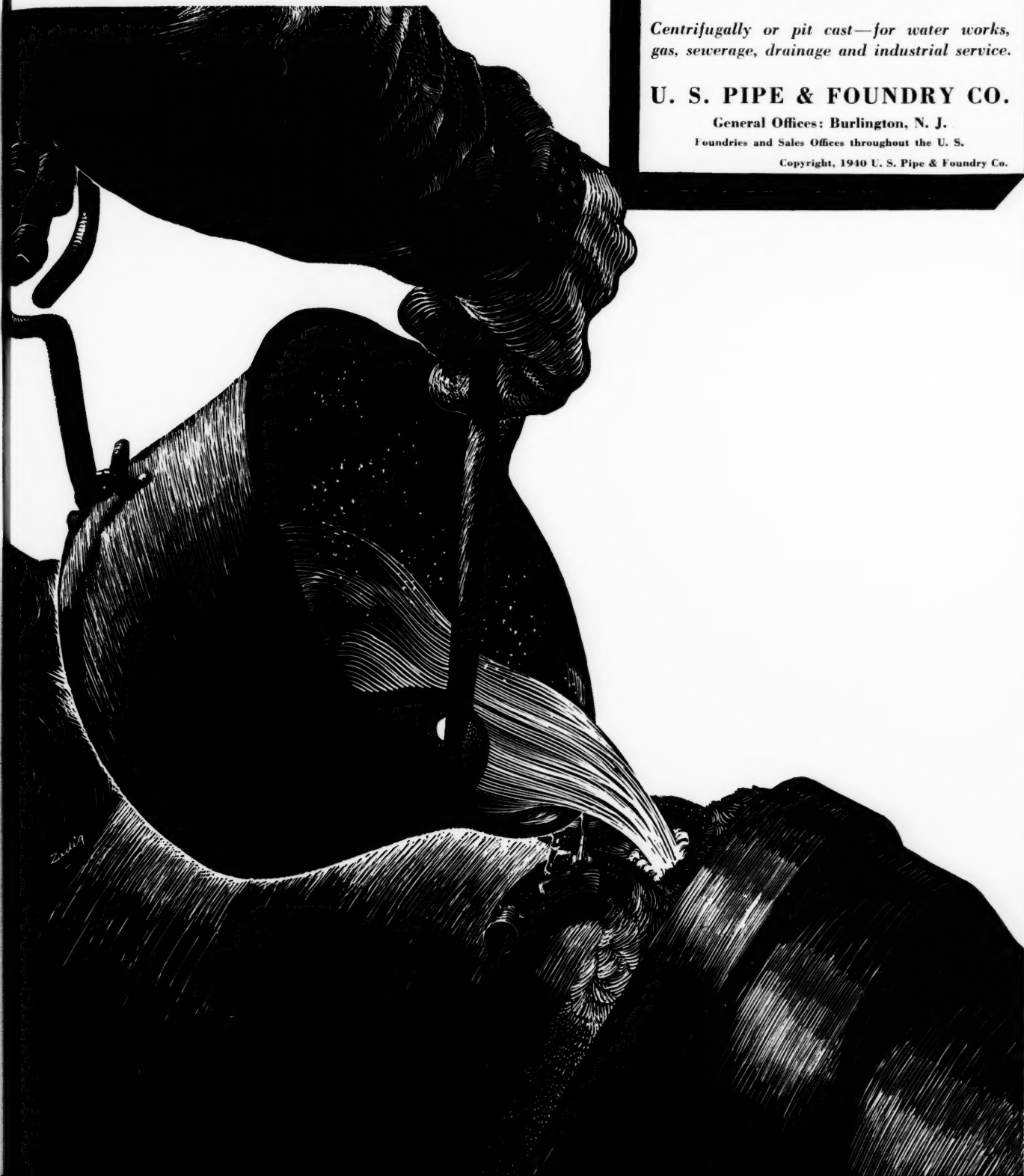
*Centrifugally or pit cast—for water works,  
gas, sewerage, drainage and industrial service.*

**U. S. PIPE & FOUNDRY CO.**

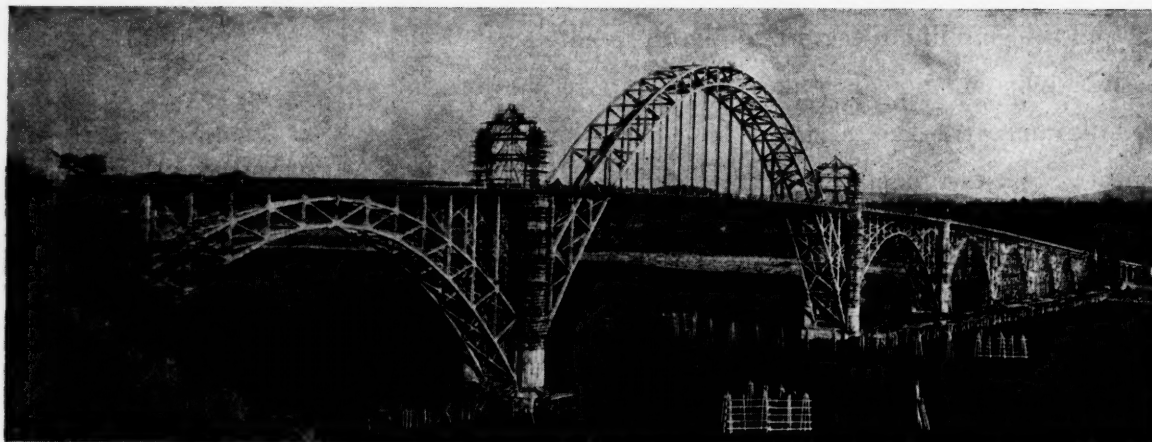
General Offices: Burlington, N. J.

Foundries and Sales Offices throughout the U. S.

Copyright, 1940 U. S. Pipe & Foundry Co.







## BRIDGES ALONG THE OREGON COAST TRAIL

Yaquina Bay Bridge, Newport, Ore., including 1-600' and 2-350' steel arch spans. Conde Bascom McCullough, Engineer.

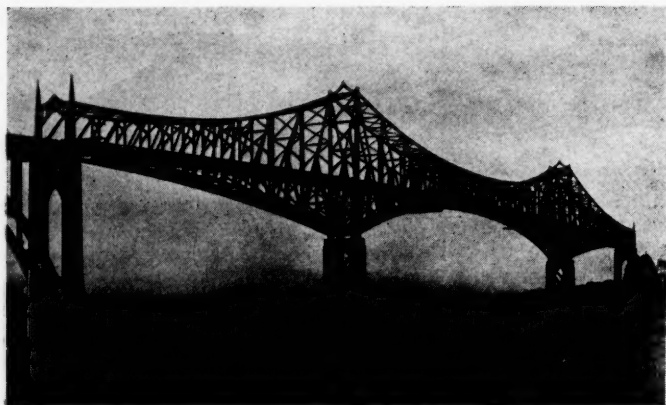
The bridges for the Oregon Coast Trail were designed in keeping with the attractions of America's most marvelous ocean shore boulevard, noted for its unrivaled sea, mountain and forest scenery. The rugged coast line necessitated the building of many bridges over the bays and inlets—five of them within the 100-mile section between Yaquina Bay at Newport on the north and Coos Bay at North Bend.

Second only in length to the bridge over Coos Bay, the Yaquina Bay bridge with its graceful arch spans is perhaps the most spectacular of the group. The steelwork for both of these structures was fabricated in our Memphis and Birmingham plants, and indicate something of Virginia Bridge technical and practical experience, as well as our facilities—not only for building bridges, but for any type of construction requiring structural steel.

Coos Bay Bridge, North Bend, Ore. Total length of main steel work 1708 ft. Length of center span 793 ft. Conde Bascom McCullough, Engineer.

### VIRGINIA BRIDGE COMPANY

Roanoke	Birmingham	Memphis
Atlanta	New York	Dallas



# Virginia Bridge

STEEL STRUCTURES  
ALL TYPES



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## THE DRIFT TOWARD NATIONAL SOCIALISM

"Smoke Screen," a book by Samuel B. Pettengill, former member of Congress, justifies reading by every thinking American. The author says in his foreword: "This book is written to demonstrate that we are moving toward National Socialism, and that from now on, we should move away from it."

The array of facts assembled between the covers of this volume of 126 pages shows how far we have drifted away from the intent and purpose of those who adopted the American Constitution and established the government of the United States.

The MANUFACTURERS RECORD since the early days of the New Deal has repeatedly declared that the peculiar philosophy which was being followed in Washington could not work to the country's advantage, but on the contrary must inevitably result in dire consequences.

The intent of Washington and Jefferson and those who established the government of the federated states has been perverted. Federal government has invaded and overthrown states' rights. Without any apparent definite policy, except that of spending, it has promoted class hatred and has passed unworkable laws that, purporting to produce harmony between employer and employe, have produced discord. As a result the depression is still with us, as well as most of the unemployment that has been haunting the country for the last eight or ten years.

Such facts as these are why business hesitates, why capital refuses to invest, why money is piled up in banks with no borrowers calling for it.

Government is no longer an umpire; it is an active participant in business and a damaging competitor of banks and private industry. Bureaucracy has overridden private initiative. Laws that kill incentive are being today vigorously prosecuted when a national emergency demands the quick building of a national defense that will call for the utmost energy on the part of everyone.

There have been delays in the defense program which to some extent have been unavoidable, but bottlenecks have been artificially imposed that stifle energy.

We have spoken elsewhere of the failure to cut down extravagance while huge sums are required for arms and armament, but the spending policy continues to be an obsession.

Incompetents still clutter bureaus to which are delegated almost the power of life and death over what was once free enterprise. Handicaps upon business in the form of the Wagner Act, the Wage and Hour Law, and other oppressive measures remain intact. New measures, such as that which will have government writing insurance annuities in competition with life insurance companies, are proposed.

The warning and the facts given in "Smoke Screen" are most timely.

## Lawrence A. Downs

Lawrence A. Downs, Chairman of the Board of the Illinois Central Railroad, and former president of the Central of Georgia Railway, died last month after a brief illness.

A veteran of forty-six years in railway work he will be greatly missed not only by his associates, but by his friends and acquaintances in all parts of the South, in the development of which he was so intensely interested.

Mr. Downs started with the Illinois Central as a rodman and progressed by successive stages from one position to another until he reached the top. A man of marked human qualities with sincere love and appreciation for his fellowmen, he referred to himself as only an average man with average attainments, but with the determination to do whatever there was to be done the best he knew how.

Railroad men of an older school, who are rapidly passing on, have been pioneers in a very real sense in their contributions to the development of the natural resources of the territories which their lines serve, and their efforts to aid the expansion of manufacturing activities long will be remembered. Of late years their work has been handicapped by a variety of causes. Among these competition has played some part, but in the main they had a more difficult task in fulfilling their rightful mission because of restrictive legislation by Federal and local governments that, apparently, has been enacted to exact the last pound of flesh from development agencies so necessary to the country's welfare.

Lawrence A. Downs grew up at a time when light could be seen ahead for every worthy development effort. In the last conversation the writer had with him he referred to the fact that "times have changed."

## Rubber Supply Outlook

The United States uses over half the annual world production of rubber, and has used as much as eighty per cent. The Dutch and British Indies furnish over ninety per cent of the supply, as plantation rubber from the East has gradually superseded wild rubber from the Americas. The latter amounted to only a small percentage of the total produced last year. With the Netherlands already swallowed up and with England's full attention being held in Europe, Japan is in the position of being able to attempt to seize the world's chief rubber supply. It is imperative, therefore, that another source from which to fill our requirements should be opened up.

Ninety per cent of the world's supply of crude rubber is obtained from *Hevea* trees, and particularly from *Hevea brasiliensis*, a native of Brazil, but less than two per cent comes from South America. Crude rubber is not produced in this

country, although attempts have been made to cultivate guayule, the wild desert shrub of Mexico and the southwestern part of the United States. Latex is obtainable from this plant, but today it is deemed unlikely that this will ever prove to be more than a negligible source of supply.

Survey of the tropical Americas to determine the most promising rubber-producing areas has already begun, according to the Department of Agriculture. Research along this line has been authorized by Congress with an appropriation of \$500,000. The various Latin-American countries involved are cooperating.

There are two parties already at work, and a third is on its way. One group is at work in southeastern Central America and parts of Colombia, and the other is covering northwestern Central America as far north as Vera Cruz, Mexico. The third party plans to survey an area which covers roughly the headwaters of the Amazon tributaries, located east of the Andes in Colombia, Peru, Brazil, and Bolivia.

Eventually the surveys will take in an area extending from Vera Cruz to Rio de Janeiro, Brazil, on the southern end of the Atlantic rain belt. Observations made in these surveys, together with present knowledge of rubber-growing in this hemisphere, will serve as a foundation for determining the locations of at least two experimental bases to be established in the most promising areas. This is an important step along the lines advocated by the American Scientific Congress, made up of representatives from the twenty-one American republics. At its recent meeting, this group urged "establishment of demonstration areas for rubber production in tropical America" and "active participation of American governments and private and commercial organizations."

Results of the rubber survey and of the experimental work that follows will be available to any American republic, and to both large and small growers. Rubber is a crop that may be produced profitably by either large or small growers, provided soil, climate, and labor conditions are right, and high-yielding, disease-free trees are planted. The rubber tree may be grown in any warm climate having a rainfall of at least seventy inches, well distributed through the year. It thrives in a wide range of soils, and after seven to ten years of growth it may be tapped every few days for years without apparent damage to the tree.

The higher yielding strains of rubber now in the Americas offset the labor advantages of the Far East, but rubber trees in tropical America are subject to the South American leaf disease. However, there are high-yielding varieties that now appear to be sufficiently resistant to reduce the seriousness of this factor. It is planned that disease-free strains of productive trees will be made available

from the experimental bases.

In spite of the fact that the Hevea tree is a native of tropical America, this hemisphere produced only about twenty thousand tons of rubber last year. About sixteen thousand tons of this was wild rubber from Brazil, and three thousand tons was guayule rubber. It is estimated that Hevea rubber can be produced in tropical America at a cost of not more than half that of synthetic rubber. It is also possible that, through research, more use may be made of the Castilla rubber tree, which grows in the colder, dryer climates on the fringes of the tropics. Two United States companies are already planting rubber in Latin America, to the extent of twenty thousand acres planted in Brazil and two thousand acres in Costa Rica and Panama.

There is one other solution to the problem of a possible rubber shortage due to the present upset in world conditions, and that is the manufacture of synthetic rubber in the United States. At the present time neoprene and the other synthetic rubbers not only fill nearly all the functions of crude rubber, but in many cases are superior to the latter. The chief objection to synthetic rubber lies in the cost, which ranges from double to as much as five times the price of crude rubber. While there is always this possibility in case of emergency, it would seem more expedient to promote the growth of rubber in the New World.

## The South's Resources

The opening article of the "South's Resources," which will be mailed to subscribers early this month, contains the following:

"This edition of the MANUFACTURERS RECORD, describing the natural resources of the Southern states, is published when the nations of Europe are gripped in a death struggle and the shadow of war extends to our own boundaries.

"The purpose originally was to give an accurate and complete account of the South's natural resources and their availability for industrial development. It now also will serve the vitally important purpose of showing the essential materials available for national defense.

"The data contained in these pages, pertaining to the raw materials of the South, presents facts not before published, and accompanying these are colored maps of each Southern state indexed to show the location of these materials and their accessibility."

There is made available in this volume, as outlined above, information important to government in the present emergency and important to private industry, upon which so much depends in the defense program and for the future welfare of the country.

For nearly sixty years the MANUFACTURERS RECORD has unceasingly proclaimed the South's

advantages. In the early days following the War between the States, the facts about the raw materials the South had in abundance were not generally known, but the determination of its people soon was manifested in upbuilding and that determination is responsible more than anything else for the truly great development that has come about.

As we review the accomplishments of the years in the development of enterprise and the creation of wealth in the Southern states, abundant evidence is afforded of what American determination can accomplish. Based upon that, and in view of the multitude of opportunities who is so bold as to deny that the progress of this country is only beginning.

The facts we shall lay before our readers in the "South's Resources" supply a broad ground for confidence in the future.

## Skilled Labor Shortage

The American Society of Tool Engineers states that metal working plants in the United States in order to take care of immediate needs, and for expansions planned for the remainder of the year, need skilled help as follows:

110,800 Tool Engineers  
408,800 Tool and Die Makers  
741,000 Skilled Mechanics

It is specifically stated that this excludes potential expansions due to possible defense requirements.

There are definite plans on the part of 53 per cent of all metal working plants to increase productive capacity this year. Shortage of skilled help is general throughout all major geographical industrial areas.

A questionnaire aiming to establish the underlying causes of the present shortage as the basis of laying the groundwork for corrective measures, showed three outstanding reasons:

1. "Educational System has not kept pace with the machine age."
2. "Union Labor's restrictive attitude toward use of apprentices by industry."
3. "Slowing down and interruption of industrial training programs through depression years."

"In connection with the last mentioned 'cause' the survey revealed that 30 per cent of plants now have some type of apprentice training program, while 41 per cent train some men in their own way for their particular requirements. Virtually all large industrial organizations now have some form of training program. Smaller plants, however, apparently have not been able to do this.

"In some industrial localities, the report reveals, industry and vocational schools are now working closely together in the co-operative training of skilled men and Tool Engineers."



# MANGANESE

## FOR DEFENSE

*Southern company converts low grade ore into high grade manganese by chemical process*

ONE of the most important developments in the mining industry of recent years is taking place in the plant of the Manganese Corporation at Anniston, Alabama. The purpose of this company is to obtain manganese from the low-grade manganese ores which abound in the South and have heretofore been regarded as almost useless commercially.

In 1938 there were 21,548 tons of manganese and manganiferous ores shipped from mines in the South, of which 10,129 tons contained thirty-five per cent or more manganese. In that year, including both domestic shipments and imports, there were 963,207 tons of ore available for consumption, of which 509,932 tons contained over thirty-five per cent manganese. This country produced but five per cent of the supply of the latter ore.

While the production of commercially usable manganese in the South has been quite limited, it may be observed that scattered from Virginia to Texas there are numerous deposits of low-grade ores, many of them quite extensive, which have not as yet been developed because of their low Mn. content. That there is a need for a method of utilization of this abundant low-grade ore has been realized for some time. As long ago as 1918 the Bureau of Mines set up an experiment station at Tucson, Arizona, and while they were able to produce manganese from low-grade ores, the cost of the process rendered it unprofitable for practical purposes.

The main use of manganese is as an alloy in various special-purpose steels. At the same time it should be borne in mind that approximately fourteen pounds of manganese are used to produce every ton of steel of all kinds in this country. Therefore it may be seen easily that in the present emergency increased supplies of manganese will be necessary, especially as increased quantities are now being used in the production of chemicals.

To supply this potential need and utilize the large quantities of domestic ore, two men conducted a series of experiments with low-grade ores. These were Edward L. Sayers, the present president of the corporation, who was for ten years vice president and general manager of the Swann Chemical Company which later

merged with the Monsanto Chemical Company, and Wiley Perry, a former Swann chemist and now Mr. Sayers' associate. The result is the present plant near Anniston, which may be best described as a large pilot plant or a small commercial producing unit.

The part of the plant's story which is of greatest value and most interest is that concerned with the actual processing of the ore. A number of processes were investigated and carefully considered, but in the end it was decided to adopt that developed by the Bureau of Mines at its Tucson Experiment Station in 1918. This development work was in progress at the end of the First World War, and it was apparently never carried to completion after the armistice. The experimental work was reported on in considerable detail by C. E. vanBarneveld in Chapter Five of Bulletin 173 entitled "Manganese."

The Bureau in its experimental work used large revolving wooden drums for its leaching. It is assumed that these were used because they were available from some previous leaching work. The Manganese Corporation adopted for its leaching equipment wooden towers of special construction with packing designed to meet the conditions inherent to leaching a pulp consisting of water and ground ore. Aside from the change in the leaching arrangements, the process used by the Manganese Corporation is essentially the same as that used by the Bureau.

As one of the additions made to the scheme of the Bureau, there is the unit in which all hard ore is crushed as it is received. It is then washed and put over a slow-moving belt for hand picking. This unit was introduced because it is possible to bring some local ores up to grade economically by washing out sand and clay and removing siliceous material.

The low-grade hard ores and all soft ores go to the second unit of the plant, where they are roll-crushed and then pulverized to pass 20 mesh in a wet process ball mill.

An attempt was made to scalp out high grade chemical ore, after pulverizing, by passing the ground material over two Wilfley tables. This, however, was not a success. It was found possible to attain a good manganese content, but not a good

manganese dioxide content. Investigation seemed to indicate that only eighty-five to ninety per cent of the manganese of local ores is present as manganese dioxide. The use of the tables was therefore abandoned.

In the third unit of the plant there are two leaching towers with their pumps, together with a number of neutralizing and settling tanks, filtering equipment and evaporating equipment. A slight departure from the flow sheet of the Bureau's report was made here. There are in the company's scheme two towers in series. The pulped ore and water enter the west tower, and after circulating for a period they are transferred to the east tower, where they are circulated for a like period and then discharged to the neutralizing tanks. The sulphur dioxide in a dilute mixture with air enters the bottom of the east tower, passes up through its packing, goes down through a partition between the two towers to the bottom of the west tower, and then up through its packing and out. The gas flow is thus seen to be counter current to the flow of the ore and water.

The manganese sulphate, after leaving the evaporator of the third unit of the plant, is dried to approximately the monohydrate stage. In the fourth unit of the plant the manganese sulphate crystals are charged into a rotary calciner, where, at approximately 900 degrees Centigrade sulphur dioxide is driven off and returned to the leaching towers. A hard clinker of manganese oxide is the residue left in the calciner. For commercial and other reasons a certain amount of raw ore is fed into the calciner with the manganese sulphate crystals, so that the clinker produced will contain about fifty per cent manganese.

In the scheme suggested by the Bureau of Mines, the pulped ore and water are subjected to the action of sulphur dioxide gas mixture in a single pass through a leaching drum. The effluent solution, said to be neutral, is then filtered. The filtrate is evaporated, and the filter cake and

wash water are formed into another pulp and are subjected to the action of sulphur dioxide gas mixture in a second pass through a second leaching drum. In the locality where the company's plant is operating, both low-grade ores and a satisfactory grade of lime are very cheap, but sulphur is fairly expensive. As long as the recovery of sulphur dioxide is high, a small loss of manganese and the use of moderate amounts of lime for neutralizing and throwing down any iron sulphate formed in leaching is not of great importance. The economics would appear to be a matter of balancing the cost of re-handling the filter cake and some extra lime.

It was thought that some difficulty might be encountered with manganese dithyonate. The sulphate solution coming from the towers at first contained a small percentage of dithyonate, but the method for controlling this feature was soon learned.

When the plant was first planned, there was some doubt as to whether there would be sufficient ore in the neighborhood of Anniston to make production at that locale worthwhile. However, this worry was alleviated by two steps taken by the company. Over sixty small deposits of low-grade ore were discovered



*The Manganese Corporation plant at Anniston, Alabama, where the chemical conversion process of producing high grade manganese from low grade ore has been made commercially possible, is described as a large pilot plant or small commercial unit.*

on near-by farms once the farmers had been interested in finding low-grade deposits. Following these discoveries, to insure that there would always be a plentiful supply, a small allied company leased property near Cedartown, Georgia, and opened a mine which gives promise of supplying sufficient low-cost ore to last the existing plant with its present capacity, indefinitely. As yet no drain has been made upon the latter source of supply.

There were many difficulties met in the

construction and initial operation of the plant. For the first two months after the plant was opened in March of this year, chief attention was focused on smoothing out the routine of operations. Starting at the end of June, however, the plant was put through thorough tests, in order to determine recoveries and capacities. On the basis of the two months of operation of the plant and of the tests made to date, the corporation predicts that the plant will have the capacity for which it was originally designed of twenty-five tons of manganese oxide clinker per day, and that, as the technique improves, a recovery of ninety per cent of the manganese charged in the ore, and eighty-five per cent of the sulphur will be attained.

## Largest Diesel-Electric Passenger Locomotive Order Placed by Atlantic Coast Line

**T**HE largest order for diesel-electric passenger locomotives in the history of this newest type of railroad motive power recently was placed by the Atlantic Coast Line Railroad with the Electro-Motive Corporation, General Motors subsidiary with factory at La Grange, Ill. The eighteen diesel-electric passenger locomotive units are expected to be in service early in the coming Florida travel season.

Last season the Atlantic Coast Line Railroad inaugurated, in connection with the Pennsylvania Railroad, the Richmond, Fredericksburg & Potomac Railroad, and the Florida East Coast Railway, a fast passenger deluxe coach streamliner, "The Champion," between New York and Miami. Its tremendous popularity with the traveling public, together with a constantly increasing volume of Florida travel and the continuing industrial and business expansion in the Southeastern states, inspired the management of the Atlantic Coast Line to expand its diesel-power and streamlined equipment, according to C. McD. Davis, Executive Vice-President of the railroad.

"The rapid gains in industry in the six Southeastern states served by the Atlantic Coast Line," Mr. Davis said, "demand corresponding developments in new and faster trains. The manufacturing centers of the South can be expected to increase their production since the European war is forcing America to supply its own markets; and we look confidently to new and greater developments in the very near future."

At the same time Mr. Davis announced that orders also had been placed by the Atlantic Coast Line and the Pennsylvania for twenty-one lightweight, stainless-steel, streamlined passenger coaches which will double last season's carrying capacity of "The Champion." This streamlined coach equipment, completely air-conditioned and of latest design, will be built by the Edward G. Budd Manufacturing Co. of Philadelphia.

Next season "The Champion" will be a fourteen-car train, instead of a seven-car train as it was in the beginning, and as now operated. It will be powered by two diesel units, instead of the single unit at present in use. In addition to "The Champion," diesel power will be operated

south of Washington on the "Vacationer," all deluxe companion coach train of "The Champion," which carries a luxurious tavern-lounge car and which is one of the most popular winter trains in New York-Florida service, also on the "Florida Special," all-Pullman deluxe train, which carries the only recreation-entertainment car in the world and which will celebrate its fifty-fourth year of consecutive seasonal service this winter.

The new equipment just ordered will increase the capacity of the all-coach passenger trains operating over the Atlantic Coast Line between New York and Florida by one-third; and is expected to expedite considerably the handling of a large volume of deluxe Pullman travel as well.

Entirely apart from this provision for enlarged and improved service between New York and Florida was the announcement a few days earlier that the Atlantic Coast Line will by next season join with the Pennsylvania, the Illinois Central, the Chicago and Eastern Illinois, Louisville & Nashville, the Nashville, Chattanooga & St. Louis, the Central of Georgia

(Continued on page 58)

# BALTIMORE BUILDING COSTS AND OPERATIONS 1900 - 1939

FOR two years the Baltimore Bureau of Buildings has studied local building operations to ascertain how the money expended for construction, additions and alterations to buildings was divided during given periods as disclosed on the face of permits issued during the past 40 years, and also to permit a comparison of past performance records with current operations in the building industry. Available records of building permits from 1900 to 1939 were compiled in comprehensive form in order that the data could be easily referred to.

It has been assumed for the purpose of this study that the number of buildings for which permits were issued by the Bureau have been erected, and the costs given throughout this paper are permit values only, the usual 20 percent for undervaluation being not included.

The various new improvements for which permits were issued from 1900-1939 inclusive were grouped into various classes of occupancy as follows:

PUBLIC ASSEMBLY BUILDINGS  
PRIVATE ASSEMBLY BUILDINGS  
DWELLINGS  
INSTITUTIONS  
OFFICE BUILDINGS  
COMMERCIAL BUILDINGS  
STORAGE BUILDINGS  
INDUSTRIAL BUILDINGS  
MISCELLANEOUS BUILDINGS &  
STRUCTURES

The records of 40 years were divided into four periods as follows:

- (1)—Period before Annexation  
1900 to 1918, inclusive
- (2)—Period since Annexation  
1919 to 1939, inclusive
- (3)—Boom Years  
1920 to 1929, inclusive
- (4)—Ten Year Period  
1930 to 1939, inclusive

Industrial expansion in Baltimore in comparison with total building operations prior to Annexation, was appreciably greater than at any subsequent period. Prior to Annexation, industrial building values constituted 18.34 percent of the total building operation costs, while during the "boom years" it was only 11.34 percent. This dropped to 7.77 percent during the last decade (1930-1939).

Industrial operations within the city proper are lagging. During 1939, for instance, industrial building construction accounted for 6.56 percent of the total outlay, representing 26 jobs amounting to \$896,875. In 1938, permits were issued for only 10 industrial buildings at a value of \$476,125, dropping to 3.25 percent

BY  
A. F. Di Domenico

of total construction, and in 1937, 50 such buildings were built at a cost of \$1,598,000 which represented 10.58 percent of the total outlay for the year. For the entire 40-year period permits were issued for a total of 3,135 industrial buildings valued at \$85,669,874 and representing 12.26 percent of the total building construction cost for the period.

Construction of school buildings has constituted a major factor in building operations in Baltimore in the last two decades. Before Annexation school buildings comprised 3.35 percent of the total dollar value. Since Annexation, however, this percentage rose to 6.02, due to the school construction program started in 1922 by the Public Improvement Commission, and extended through 1936. This program had the effect of raising the value to 5.76 percent of the total operations during the "boom years," approxi-

mately 2½ percent higher than the period prior to Annexation. During the "depression years," the percentage increased to 7.50, nearly equal to industrial work, which was 7.77 percent.

The following tabulation shows the number, cost and percent of total dollar permit value of school building construction during given periods:

Period	Number	Cost	Percent of Total Permits
1900—1918	79	\$5,591,116	3.35
1919—1939	168	32,046,894	6.02
1920—1929	106	21,114,794	5.76
1930—1939	58	10,825,600	7.50
1900—1939	247	37,638,010	5.39

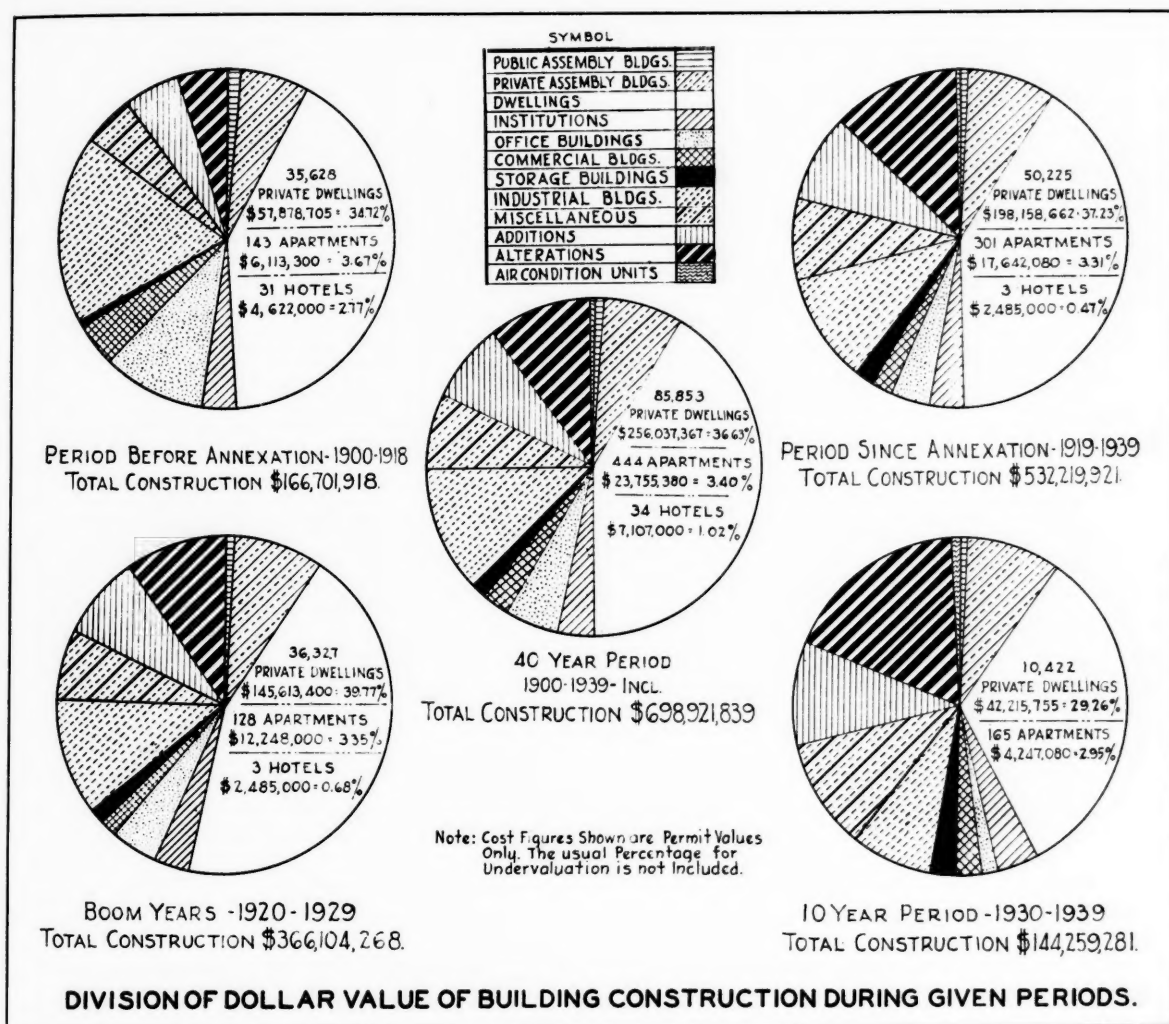
For the entire 40-year period, it is seen the division of the dollar value for school building construction was 5.39 percent, mainly due to the Public Improvement Commission program, upon the completion of which it dropped to 2.57 percent in 1937 and 3.08 percent in 1938. No schools were erected in 1939.

Another major factor in building operations is additions and alterations to ex-

TABLE "A"

Year	No. of Operations	Permit Value	Undervaluation	Total Cost
1900	1,836	\$1,212,100	\$1,263,630	\$5,475,730
1901	1,803	3,439,200	1,031,760	4,470,960
1902	1,817	5,270,600	1,581,180	6,851,780
1903	1,599	5,673,300	1,701,990	7,375,290
1904	2,085	13,206,100	3,961,830	17,167,930
1905	3,138	14,816,930	2,963,386	17,780,316
1906	3,836	9,990,300	1,998,060	11,988,360
1907	3,332	7,648,500	1,529,700	9,178,200
1908	3,187	7,223,900	1,444,780	8,668,680
1909	3,363	8,483,500	1,696,700	10,180,200
1910	3,274	10,369,800	2,073,960	12,443,760
1911	3,439	9,354,400	1,870,880	11,225,280
1912	3,120	8,316,900	1,663,380	9,980,280
1913	3,486	9,271,900	1,854,380	11,126,280
1914	5,401	13,028,300	2,605,660	15,633,960
1915	6,422	10,290,500	2,058,100	12,348,600
1916	11,770	12,554,228	2,510,846	15,065,074
1917	9,107	8,513,598	1,702,719	10,216,317
1918	5,486	5,037,862	1,007,572	6,045,434
1919	15,995	21,856,372	4,371,274	26,227,646
1920	16,183	29,273,100	5,854,620	35,127,720
1921	18,516	30,392,530	6,078,506	36,471,036
1922	19,418	35,863,700	7,172,740	43,036,440
1923	20,017	39,442,523	7,888,505	47,331,028
1924	25,280	45,346,150	9,069,230	54,415,380
1925	22,093	46,650,770	9,330,154	55,980,924
1926	22,317	42,556,155	8,511,231	51,067,386
1927	20,631	28,290,790	5,658,158	33,948,948
1928	17,449	34,389,650	6,877,930	41,267,580
1929	19,330	33,898,900	6,779,780	40,678,680
1930	10,915	26,583,410	5,316,682	31,900,092
1931	15,688	24,642,600	4,928,520	29,571,120
1932	11,344	12,653,100	2,530,620	15,183,720
1933	8,072	5,474,255	1,094,851	6,569,106
1934	7,467	8,413,880	1,682,776	10,096,656
1935	8,054	8,288,450	1,657,690	9,946,140
1936	9,249	14,736,600	2,947,320	17,683,920
1937	9,891	15,162,010	3,032,402	18,194,412
1938	10,416	14,640,038	2,968,046	17,608,084
1939	11,404	13,664,938	2,732,988	16,397,926





isting buildings. When building operations were at low ebb, during 1930-1939, the figures reveal that alterations of existing buildings reached an all-time high of 18.43 percent, surpassed in this period only by the construction of private dwellings at 29.26 percent. The full significance of this figure is emphasized by considering that the 40-year average for alterations accounted for but 10.53 percent of the total construction cost and 55.48% of total volume. Additions in the depression period accounted for 10.08 percent

of the total construction outlay, compared with the 40-year average of 7.78 percent.

The sharp gains in expenditures for both alterations and additions during the last ten years apparently were due to the drop of approximately 10½ percent in private home construction from the previous decade, because economic conditions caused families to repair or add to their present facilities rather than to erect new dwellings. This is made more obvious because in 1938 and 1939 alterations and additions again dropped, while dwelling

construction rose higher than the average 40-year period.

Before Annexation, the period of rebuilding following the 1904 fire, office building construction accounted for 9.97 percent of the outlay covered by permits, for a total of 261 projects, large and small, at a permit value of \$16,611,900 while for commercial building the percentage was 4.43 for 1,126 jobs at a valuation of \$7,387,745.

In no subsequent period did the per-

(Continued on page 43)

#### DIVISION OF DOLLAR VALUE OF BUILDING CONSTRUCTION DURING GIVEN PERIODS

	Period Before Annexation 1900-1918			Period Since Annexation 1919-1939			Boom Years 1920-1929			10 Year Period 1930-1939			40 Year Period 1900-1939		
Class of Occupancy	No.	Cost	%	No.	Cost	%	No.	Cost	%	No.	Cost	%	No.	Cost	%
Public Assembly Bldgs.	123	\$ 1,771,700	1.06	68	\$ 2,608,200	0.49	31	\$ 1,757,500	0.48	29	\$ 694,700	0.48	191	\$ 4,379,900	0.62
Private Assembly Bldgs.	270	10,983,816	6.59	394	44,388,594	8.34	275	30,903,794	8.44	108	13,155,600	9.12	664	55,372,410	7.92
Dwellings	35,802	68,614,005	41.16	50,529	218,285,742	41.01	36,458	160,346,400	43.80	10,587	46,462,835	32.21	86,331	286,899,747	41.05
Institutions	82	5,787,843	3.47	98	18,086,800	3.40	63	12,282,000	3.35	34	5,654,800	3.92	180	23,874,643	3.42
Office Buildings	261	16,611,900	9.97	222	19,139,150	3.60	150	16,924,500	4.62	68	2,144,350	1.49	483	35,751,050	5.11
Commercial Bldgs.	1,123	7,387,745	4.43	1,603	10,207,120	1.92	1,134	6,442,200	1.76	462	3,729,235	2.58	2,729	17,594,865	2.52
Storage Buildings	83	587,000	0.35	2,501	9,106,535	1.71	2,084	5,513,300	1.51	417	3,593,235	2.49	2,584	9,693,535	1.39
Industrial Bldgs.	1,786	30,568,523	18.34	1,349	55,101,351	10.35	806	41,493,150	11.33	340	11,208,000	7.77	3,135	85,669,874	12.26
Miscellaneous	2,045	8,125,510	4.87	41,144	42,525,533	7.99	26,328	24,564,569	6.71	13,131	15,466,802	10.72	43,189	50,651,043	7.25
Total New Construction	41,578	\$150,438,042	90.24	97,908	\$419,449,025	78.81	67,419	\$300,227,693	82.00	25,176	\$102,100,557	70.78	139,486	\$569,887,067	81.54
Additions	10,803	8,621,376	5.18	29,023	45,773,700	8.60	14,834	29,135,265	7.96	12,612	14,535,108	10.08	39,826	54,395,076	7.78
Alterations	25,130	7,642,500	4.58	198,598	65,973,034	12.40	118,991	36,741,310	10.04	70,502	26,590,454	18.43	223,728	73,615,534	10.53
Air Condition Units				210	1,024,162	0.19				210	1,024,162	0.71	210	1,024,162	0.15
TOTAL	77,511	\$169,701,918		325,739	\$532,219,921		201,244	\$366,104,268		108,500	\$144,259,281		403,250	\$698,921,839	



# MARKED CHANGES IN TRADE BETWEEN THIS COUNTRY AND UNITED KINGDOM

UP to the present time there has been little or no knowledge concerning this country's trade with the United Kingdom during the Second World War. In view of the exceedingly sharp changes in certain major items of our exports and imports, the subject is of particular interest. The situation has proven the source of considerable conjecture, with no definite word from any authoritative agency.

Figures recently released by the Department of Commerce cover the period from September, 1939, through May, 1940, the first nine months of the current war. During this time the exports to the United Kingdom totalled \$475,848,000, while the imports to this country were worth \$106,917,000.

As will be seen in the accompanying tables, wide variations of increase and decrease occur in both exports and imports of certain items during the comparable periods September 1938-May 1939 and September 1939-May 1940. The following are examples: ex-

ports of raw cotton increased from \$18,109,000 to \$96,546,000; wood pulp, from \$778,000 to \$4,331,000; boxboard, from \$696,000 to \$2,648,000; lubricating oils and greases, from \$9,697,000 to \$19,293,000; iron and steel scrap, from \$1,090,000 to \$7,305,000; steel ingots, blooms, billets, etc., from \$3,000 to \$12,113,000; aluminum and manufactures, from \$3,094,000 to \$10,864,000; metal-working machinery, from \$15,554,000 to \$43,486,000; and aircraft, including engines and parts, from \$15,612,000 to \$23,231,000. Exports of wheat declined from \$13,952,000 to \$713,000; citrus fruits, from \$2,476,000 to \$171,000; apples, from \$5,521,000 to \$1,325,000; tobacco, from \$169,335,000 to \$33,454,000; and steel sheets, ungalvanized, black, from \$2,524,000 to \$403,000.

Should the trade between the two nations continue at the pace which it has been holding for the first five months of this year, the exports for 1940 will amount to \$674,215,000, and the imports will be

\$150,917,000. These figures, of course, are only approximate estimates, based on the continuance of the status quo, but it is encouraging to note that they represent an increase of \$168,811,000 over the 1939 exports, and that there is also a slight increase in the imports.

Of course, with the active prosecution of war, involving an extensive naval blockade, normal relationships, insofar as international trade is concerned, are disrupted. Therefore, the 1940 or wartime figures have little significance in comparison with former years. However, these figures do have definite value as an indication of what goods are in demand, and the extent to which these exports replace those to other countries which have been curtailed.

Using the nine months from September to May as a basis, the following table compares, by commodity groups, the first nine months of the war with the corresponding period a year earlier.

VALUE OF EXPORTS AND IMPORTS BETWEEN U. S. AND UNITED KINGDOM  
(Nine month period, September-May)

	Exports		Imports	
	1938-39	1939-40	1938-39	1939-40
Animals and their products, edible .....	\$29,990,000	\$24,696,000	\$ 660,000	\$ 414,000
Animals and their products, inedible .....	9,814,000	9,352,000	8,127,000	7,655,000
Vegetable food products and beverages .....	63,350,000	40,901,000	28,180,000	27,828,000
Vegetable products, inedible .....	93,734,000	30,870,000	1,320,000	1,104,000
Textile fibers and manufactures .....	24,873,000	103,053,000	31,989,000	32,307,000
Wood and paper .....	14,999,000	22,170,000	1,618,000	1,746,000
Nonmetallic minerals .....	39,125,000	46,225,000	4,167,000	4,483,000
Metals and manufactures .....	18,365,000	55,380,000	14,698,000	14,340,000
Machinery and Vehicles .....	66,663,000	109,125,000	2,073,000	2,426,000
Chemicals and related products .....	13,246,000	22,448,000	4,119,000	4,415,000
Miscellaneous .....	10,892,000	6,015,000	14,011,000	10,199,000

From this table it may be noted that while for the most part traffic in the agricultural products has declined, two classifications important to the South have shown increases. These are textile fibers and textile manufactures, together with wood and paper. But these are by no means all, for nonmetallic minerals, metals and manufactures, machinery and vehicles, and chemicals and related products were also exported in greater amounts than in the corresponding period in the preceding year, and these are becoming important manufactures in the South.

The following commodities are those which make up the greater part of our

exports and imports. The values are as compared with the same period a year given for the first nine months of the war, earlier.

## Exports

Commodity	Sept. '38-May '39	Sept. '39-May '40
Lard .....	\$9,267,000	\$4,407,000
Shrimp .....	390,000	199,000
Undressed Furs .....	6,093,000	6,316,000
Corn .....	7,665,000	4,640,000
Barley .....	2,524,000	1,043,000
Wheat Flour .....	194,000	233,000
Wheat .....	13,952,000	713,000
Linseed Cake .....	186,000	6,000
Citrus fruits .....	2,476,000	171,000
Apples .....	5,521,000	1,325,000
Dried and evaporated fruits .....	5,265,000	4,050,000
Canned fruits .....	16,225,000	16,794,000

Sugar, refined .....	1,029,000	434,000
Rosin .....	1,116,000	2,558,000
Gum spirits of turpentine .....	746,000	871,000
Other naval stores .....	349,000	798,000
Peppermint oil .....	324,000	565,000
Vegetable dyeing and tanning extracts .....	479,000	601,000
Tobacco .....	169,335,000	33,454,000
Cigarettes .....	187,000	57,000
Corn starch and corn flour .....	2,067,000	3,018,000
Cotton, raw .....	18,109,000	96,546,000
Cotton linters .....	589,000	1,552,000
Cotton pulp .....	263,000	53,000
Cotton-mill waste .....	890,000	1,799,000
Sawed timber, southern pine .....	918,000	768,000
Boards, planks, and scantlings .....	8,536,000	5,164,000
Tight staves .....	308,000	555,000
Veneers .....	301,000	675,000
Handles .....	360,000	606,000
Wood pulp .....	778,000	4,331,000
Rags and other paper stock .....	314,000	515,000
Wrapping paper, except Kraft .....	104,000	223,000
Boxboard .....	696,000	2,648,000
Vulcanized fiber sheets, strips, etc. ....	347,000	470,000
Other wood and paper .....	2,337,000	6,215,000
Gasoline .....	16,058,000	10,794,000
Crude petroleum .....	283,000	535,000
Gas and fuel oil .....	6,213,000	4,164,000
Naphtha, solvents, etc. ....	250,000	220,000
Illuminating oil .....	1,876,000	1,222,000
Lubricating oils and greases .....	9,697,000	19,293,000
Paraffin wax .....	993,000	2,616,000
Artificial abrasives, crude and in grains ....	462,000	738,000
Crude sulphur .....	1,337,000	1,931,000
Other nonmetallic products .....	1,946,000	4,712,000
Pig iron .....	9,000	2,340,000
Iron and steel scrap .....	1,090,000	7,305,000
Steel ingots, blooms, billets, etc. ....	3,000	12,113,000
Iron and steel bars and rods .....	280,000	435,000
Steel sheets, black, ungalvanized .....	2,524,000	403,000
Strip, hoop, band and scroll iron and steel ...	700,000	374,000
Ferro-alloys .....	646,000	1,717,000
Aluminum and manufactures .....	3,094,000	10,864,000
Refined copper, ingots, bars, etc. ....	2,531,000	5,486,000
Brass and bronze and manufactures .....	367,000	1,624,000
Nickel, monel metal, and alloys in ingots, bars, rods, etc. ....	1,175,000	3,438,000
Lead, pigs, bars, sheets and pipes .....	524,000	79,000
All industrial machinery .....	20,019,000	48,934,000
Construction and conveying machinery ....	959,000	1,500,000
Well and refinery machinery .....	382,000	644,000
Metal-working machinery .....	15,554,000	43,486,000
Electrical goods and apparatus .....	2,934,000	4,613,000
Tractors and parts .....	3,041,000	5,362,000
Automobiles, parts and accessories .....	6,818,000	4,889,000
Aircraft, including engines and parts .....	15,612,000	23,231,000
Other machinery and vehicles .....	12,319,000	18,770,000
Pyroxylin plastic film support .....	1,571,000	2,201,000
Cellulose acetate plastic film support .....	368,000	1,412,000
Nitro and aceto cellulose .....	254,000	683,000
Inorganic acids and anhydrides .....	226,000	579,000
Alcohols .....	139,000	500,000
Carbon black or gas black .....	2,179,000	2,778,000
All other chemicals and related products ....	2,550,000	13,188,000
Miscellaneous domestic articles .....	10,892,000	6,015,000
Reexports of foreign merchandise .....	3,593,000	5,612,000

## Imports

Commodity	Value	
	Sept. '38-May '39	Sept. '39-May '40
Leather goods .....	3,159,000	2,611,000
Undressed furs .....	1,494,000	1,820,000
Other animals and animal products, inedible ..	3,798,000	3,548,000
Whiskey and malt liquors .....	682,000	26,411,000
Cotton waste .....	275,000	297,000
Cotton cloth .....	1,804,000	1,917,000
Cotton nets and nettings, machine made ....	490,000	436,000
Jute burlaps .....	2,156,000	1,948,000
Yarns, single, of flax, hemp or ramie .....	635,000	469,000
Woven fabrics of flax, hemp or ramie .....	4,481,000	5,301,000
Napkins, towels, sheets and pillowcases ....	1,129,000	1,518,000
Woolen goods .....	10,647,000	11,378,000
Rayon filaments not exceeding 30 inches in length .....	3,333,000	2,333,000
Platinum ores .....	3,534,000	6,143,000

## New Train Service In South

The Kansas City Southern-Louisiana and Arkansas Railroads have made plans to inaugurate a new streamliner train service between Kansas City and New Orleans. It is expected that the new aluminum train, the "Southern Belle" will operate as three trains with fast schedules in each direction.

Each train, it is said, will have a Diesel-electric locomotive, mail and baggage car, coach, sleeper and observation-parlor diner.

## Underground Tanks For Oil

A dispatch from Oklahoma City quotes Robert E. Wilson, petroleum expert of the National Defense Advisory Commission, as suggesting underground tanks for the storage of vital petroleum products to forestall possible destruction by attacks from the air.

Coupled with this is the further suggestion of the laying of new pipe lines along the Atlantic seaboard to reduce the hazard of overcrowding of our transports.

It was emphasized that the petroleum resources of the United States are ample to fully meet modern war demands. This was further emphasized in a statement attributed to W. R. Boyd, Jr., executive vice president of the American Petroleum Institute, who is confident of the full preparedness of the petroleum industry to meet both military and civilian needs.

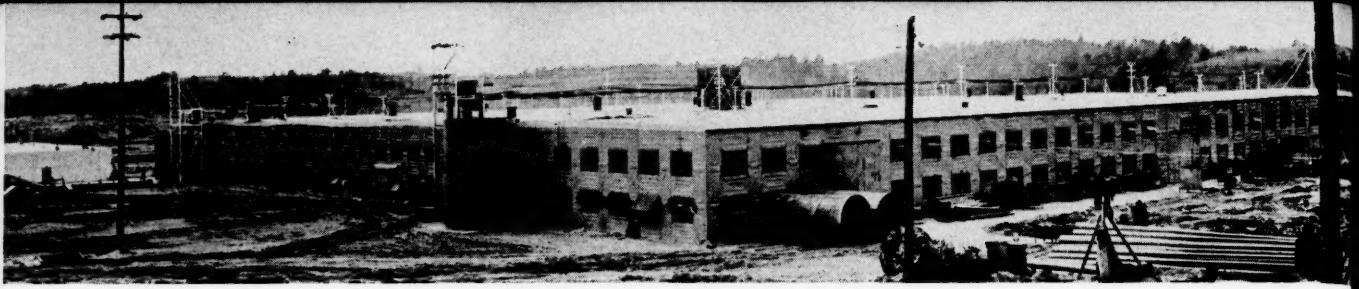
## Sixty-five Questions A Day

"The 60,000,000 forms filed by industry, etc., asked an average of 65 questions each, or nearly 4 billion question in all. Small retail stores filed 10 returns a year, averaging 50 questions. Automobile companies filed 250 returns a year, and railroad companies 1,000 annually, or 3 per working day. The figures in this paragraph refer only to the federal government. They help to explain why the 'tired business man' gets that way."—from "Smoke Screen."

## A Remarkable Industry

The automobile output from January 1st to the middle of August is reported as over 2,750,000 units. This remarkable industry, which has almost an unbroken record of success in gauging and increasing public demand, is already at work and turning out its new models with many promised improvements.

The organization in giant plants is the more remarkable when it is considered that what is being done is in the face of new tooling, new designing and a new build up of effort to take care of pressing government orders for airplanes and other defense products. It is also more remarkable when it is considered that there are over 30,000 parts in an automobile which are made to fit precisely, as cars roll down the assembly lines at the rate of many thousands per day.



# NEW GEORGIA FACTORY BUILT AND EQUIPPED FOR ARC WELDING

**T**HE new \$3,000,000 Le Tourneau factory project rapidly nearing completion at Toccoa, Georgia, has been designed, planned, built and equipped for manufacturing by the electric arc process of welding. It embodies principles developed and perfected by R. G. Le Tourneau in more than 20 years experience in the use of arc welding not only in his own manufacturing operations but also in the erection of buildings and housing facilities.

The factory proper is 370 ft. long x 370 ft. wide and 23 ft. high, which contains machine tools valued at \$728,000. This equipment consists of: 2 bending rolls, 2 hydraulic presses, 2 bending brakes, 2 power shears, 1 drop hammer, 4 shapers, 60 lathes of Le Tourneau design, 7 gear cutters, 4 miller machines, 8 drill presses, 6 hack saws, 3 punch presses, 1 vertical broach, 2 turret lathes, 4 bar machines, 2 case boring machines, 8 engine lathes, 1 external and 1 internal grinder, 2 boring machines, 4 radial drills, 4 tool grinders and 1 bar and angle roll. Facilities also include: 3 electric furnaces, 5 oil fired furnaces, 1 camograph torch cutting machine, 60 arc welding generators, 1 oxygen plant and 1 acetylene plant.

The 60 arc welders installed in the factory are of the SAC type manufactured by The Lincoln Electric Company, Cleveland, Ohio. Approximately 75 tons of Shielded Arc type of electrodes supplied by the same company have been used up till now.

Other buildings in the project include:

BY  
**J. R. Morrill**  
*Lincoln Electric Company*

an office building 160 ft. long x 115 ft. wide x 11½ ft. high; a hotel consisting of a center dome structure 100 ft. in diameter and 7 wings extending outward in fan shape, each 32 ft. wide x 125 ft. long; 40 employees residences; and a warehouse 92 ft. x 92 ft.

All of these buildings are erected entirely by arc welding. When completed the project will also include: a cattle barn 115 ft. long x 46 ft. wide; a milk cow barn accommodating 50 cattle; a pasteurizing building; a canning building; several silos; employees' recreation hall; a 200 ft. tabernacle; a 250 watt radio station; cafeteria stores, additional houses (60 planned); and other miscellaneous structures.

The arc welded development which permitted the unique construction employed in all buildings and which was created by Le Tourneau, is a fabricated steel panel forming the main structural element utilized in walls and roofs of all structures.

This arc welded steel panel is 46" wide x 92" long fabricated of 12 gauge open-hearth structural steel sheets. These sheets are stamped under 600 tons pressure into a sunken panel design, the edges being turned down 1 inch all around during the stamping operation. Two of these sheets, with the turned edges toward each

other, are welded together with interior spacers set at intervals of not more than 24 inches to form a box-like unit. Maximum strength and rigidity are provided by pressed steel braces welded into a lattice web pattern all around the edges. Under test, one of these units withstands a weight of 100 lbs. per square foot without any deformation. Approximately 8 minutes is required to set up, weld and remove from the jig one panel.

In field erection, the two turned edges of each panel provide a surface for welding it to an adjoining panel in order to form walls, partitions, floors or ceilings. Into each section rock wool is forced by air to a density of 10 lbs. per cubic foot.

These panel sections are 6 inches thick for house construction and 18 inches thick in factory and other structures.

In construction of houses and smaller structures the panels are erected individually. However, in the factory building there was sufficient area of concrete floor to allow assembly of panel sections 23 ft. square and complete welding of each section in flat position before erection. These sections were then hoisted in place and welded.

The production set-up of the new factory is entirely different from the usual type of plant employing conventional methods of manufacture. All equipment and organization is directed to one end—the production of welded products.

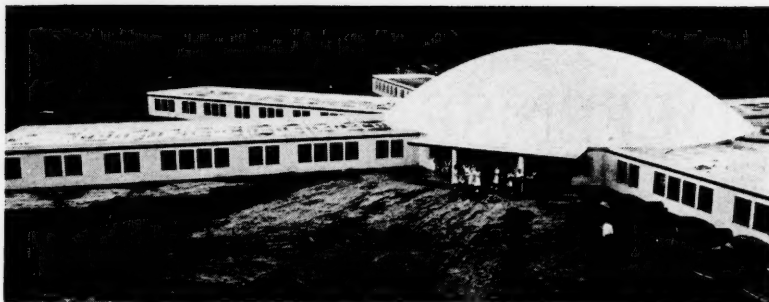
Arrangement is in seven aisles. The aisle adjacent to the railroad side contains the shipping department, steel storage, department for forming box beams used extensively in Le Tourneau products, plate cutting department and storage of hack saws and bar shear; the adjacent aisle contains the painting department, shear and bending brake facilities, and the press section; the third aisle has the cleaning department, control room for semi-finished parts and a department for welding large and small parts; the fourth aisle provides the assembly floor for



*Above—The factory building as it neared completion. It is 370 feet square, 23 feet high and is equipped with machine tools estimated at close to three quarters of a million dollars.*

*Left—Among the several other buildings located on this plant site is a warehouse, pictured here, which measures 92 feet square.*





Among the various buildings in the Le Tourneau project is an office building 160 feet long and 115 feet wide, but possibly one of the most unusual is the auditorium-hotel shown at left: The center dome covering the auditorium is 100 feet in diameter and from it radiates seven wings each 32 feet wide and 125 feet long. Below is one of the 40 fabricated steel employees residences.

equipment, the machine shop and tool room; in the fifth aisle are the department for wheel assembly and welding, internal and external grinding, heat treating and tool storage; the sixth aisle houses the experimental and jig fabrication departments, final inspection and additional machine shop facilities; the last aisle is for material storage, electrical department, oxygen plant and shop meeting room. A large portion of the factory floor, extending from aisle 1 to aisle 7, is given over to welding and assembly of the scrapers.

Reflecting Mr. Le Tourneau's great re-

ligious zeal, the Toccoa project provides the South with a unique conference ground, for he has placed this facility, called Lake Louise Conference Grounds, in honor of his daughter, Mrs. Louise L. Dick, at the disposal of all denominations and groups for Christian activities. The large hotel, having a huge round lobby 100 ft. in diameter and containing seating capacity for 800 people is the main structure. The dedication of the grounds took place last month when the National Conference of the Business Men's Evangelistic Groups was in session.



## MOBILE'S MODERN FRUIT HOUSE

**I**NCREASED imports of tropical fruit, particularly bananas, are expected through the port of Mobile, Ala., as the direct result of the new fruit house built at a cost of many thousand dollars by the Mobile and Ohio Railroad and leased to the United Fruit Company, operators of the "Great White Fleet" of fast fruit carriers.

Under the steel and asbestos protection of the new 81 by 562-foot shed, forces of the fruit concern handle in the neighborhood of 70,000 stems of bananas brought to Mobile each week and shipped by rail to other parts of the country.

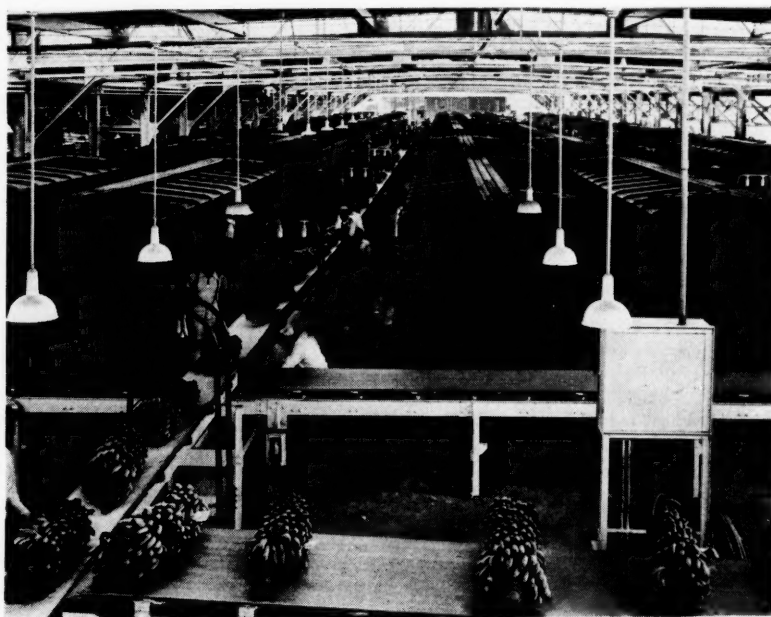
Forty-five refrigerator cars can be spotted at one time in the building to receive the bananas. The fruit is unloaded by gantry cranes from the ship holds to the five long conveyors, where they are graded according to size as they move along to the railroad cars. Capacity of the system of mechanical stevedores is 6,000 bunches an hour. The installation, cost of which is placed at \$150,000, was made by the United Fruit Company.

After the railroad cars receive their loads of the tropical fruit, they are shifted to the icing platform, with its capacity for loading 21 cars simultaneously prior to the long journey to the distant destinations to which they are sped.

In addition to the banana loading tracks inside, the new building contains offices and four ripening rooms at the south end. Fruit found too ripe for re-shipment is stored in these ripening spaces and sold locally and in nearby markets. An additional 10 cars can be accommodated by a track extending the outside length of the building, with provision for

three cars at the ripening room platform.

Foster & Creighton Co., of Nashville, Tenn., erected the new building, which is located at pier 1 of the Mobile and Ohio Railroad. Work was done under supervision of H. Austill, railroad chief engineer. The building permit issued for the project called for an expenditure of \$68,000.





# MATERIALS NEEDED FOR DEFENSE

## PART II

### ASBESTOS

The first part of the following article was printed in the August MANUFACTURERS RECORD. It contained a list of all the materials designated as strategic by the Army and Navy Munitions Board.

The present article, part II, deals with the critical materials. Critical materials being those which are essential in a lesser degree than strategic materials or are available in more adequate quantities in this country.

As previously stated, it should be borne in mind that many of these materials are not produced in the United States; and while substitutes are known or being pursued for such use as can possibly be made of them, times of emergency create demands far in excess and far more rapidly than ordinary production and consumption is geared to or capable of relinquishing. Furthermore, not a few of these materials are unobtainable, for one or more reasons, from any other source than that now employed. Others are of a perishable character thus circumventing the possibility of any large storage.

In comparison with the list of materials similarly classified during the last war, the present list is comparatively small, due almost entirely to the ingenuity of United States manufacturers with their vast research programs. As indicated above, some substitutes already are known or being perfected, but as long as we have a list of strategic and critical materials those products remain for American producers to find substitutes for them. This is a challenge of major proportion because the uses to which these materials are put are not only varied but highly exacting and frequently demand the presence of diverse characteristics not all of which are always present in substitutes while just as often the synthetic product contains characteristics or properties of a counter kind. Ed.

### ALUMINUM

Aluminum was formerly listed as a strategic material, but years of research and technical development together with the supply of bauxite have materially reduced the problem of shortage. Its lightness and strength are the factors which have most influence in its use, which occurs mainly in air, land, and water transportation equipment, general industrial and structural application, and cooking utensils. While our own supply of bauxite, the ore from which aluminum is derived, is by no means small, and occurs principally in Arkansas, Georgia, and Alabama, for various economic reasons we normally import large amounts from British and Dutch Guiana. United States production of bauxite in 1938 was 323,818 long tons, and of aluminum, 143,441 short tons. Imports of bauxite in that year came to 455,693 long tons, while imports of aluminum had a value of \$3,379,018.

Asbestos is a general term applicable to any of several minerals which exist in fibrous form, but which may be slightly different in composition. It may be spun, woven, or felted as any vegetable fiber may, but unlike vegetable fiber, it is fireproof, weatherproof, and highly resistant to chemical action. It is almost indispensable in modern life, being used in brake band linings, clutch facings, gaskets and packings for steam-driven machinery, heat insulation in home and factory, and in roofing and other building materials when combined with cement. The United States is the largest asbestos consumer in the world, but in 1938 sales of domestic producers constituted but 6 per cent of the volume and 4 per cent of the value of domestic requirements. Stimulation of domestic production seems to bear little promise, and in case of emergency the most likely course would be the use of mineral, slag, and glass wool in the building trade, freeing all available stocks for essential uses. At the same time, all exports of asbestos products, which were valued at \$2,500,000 in 1938, could be stopped. Canada is by far the world's greatest producer of asbestos, and supplies most of our imports.

### CORK

Cork in all its forms comes from the bark of a species of oak tree, which grows in commercial stands only in areas bordering the Mediterranean sea. Its most important physical properties are buoyancy, compressibility, resilience, resistance to moisture and liquid penetration, frictional quality, low thermal conductivity, ability to absorb vibration and stability. The oak (an evergreen) from which cork is derived will only grow on a narrow belt of land bordering on the Mediterranean Sea. All attempts to establish cork forests elsewhere have met with failure. The United States in 1938 imported 80,000 tons of cork, representing 40 percent of world production. The breakdown of manufactures in this country shows: cork stoppers and natural cork specialties, \$3,500,000; cork insulation products, \$6,770,000; cork composition and composition products, \$5,100,000; cork tile, \$115,000; cork marine goods, \$130,000. A shortage of cork in an emer-

gency would entail serious difficulties. Although substitution is possible in many cases, there are some where it is not, and in other cases there might be a shortage of the substitute itself as is the case with rubber. Were we denied imports, conservation, substitution, and some degree of control of cork stocks would be necessary.

### GRAPHITE

Graphite, consisting of crystalized carbon and chemically identical with diamonds is nevertheless the softest of minerals. It has been, and, to a negligible extent, is being produced in this country, but we rely principally on imports. In 1938 the United States imported slightly more than 17,000 tons, while Canada usually supplies all our imports (about 1,000 tons annually) of artificial graphite. Graphite is used for linings, facings, core washes and crucibles in the foundry and steel industry; for paints and pigments, pencils, crayons, commutator brushes, stove polish, lubricants, and in the manufacture of electrodes. High purity graphite, either natural or artificial, may be used for brushes for electrical machines, special furnace blocks, carbon raiser (for raising the carbon content of steel), battery (dry-cell) graphite, and electrotyping graphite. Of these, the chief military uses are foundry and crucible work, paints and pigments, electrical machine brushes, electrodes, and dry batteries.

A small quantity of graphite is produced in at least three southern states.

### HIDES

The hides and skins of various animals form the raw material for leather. The heavier grades are generally manufactured into sole and belting leather, those of extra large surface are used in upholstery, and the skins go into the manufacture of upper shoe, bag, and glove leather. The chief source of imported hides for sole leather is South America, of which cattle hides constitute the bulk. It is believed that no particular emergency problem will present itself with regard to leather, except for this sole leather, as we are to a large degree self sufficient, and the military requirements are lessening considerably, due to mechanization doing away with the need for harness and other animal transport equipment. Also, many substitutes are available and their use is growing rapidly.

## IODINE

Formerly the United States was entirely dependent on imports for its supply of iodine, but it is now produced in this country, from salt brines obtained from abandoned oil wells, to such an extent that we are now the world's second largest producer, and are capable of supplying our entire peace time needs. It is used extensively in medicine, externally as an antiseptic and internally for the alternatives contained in the salts, which do not contain the germicidal qualities of the element itself. Its widest commercial use is in sensitizing solutions for photographic films, plates, and papers. The item is kept on the critical list because the domestic industry is young, and it is felt that there might be some difficulty in maintaining domestic production to the degree necessary for emergency needs especially as there are no satisfactory substitutes for this item for field use as an antiseptic in the armed forces.

Since the domestic source is from salt brines in abandoned oil wells, it is likely that the South will participate to a marked degree.

## KAPOK

Kapok is a vegetable down obtained principally from Java, although in recent years some kapok has been harvested and exported from the Philippines. The cellular structure and shape of the fiber together with its low specific gravity renders it especially adaptable for commercial use as a stuffing material for life-saving equipment, pillows, mattresses, and upholstery. This country imported 9,379 tons of kapok in 1939, slightly under a third of the world's production. The principal substitutes for life-saving appliances are British Indian "Kapok" (an inferior product, not genuine kapok) and reindeer hair.

## OPIUM

Opium is obtained by incising the unripe capsule of the white poppy. There are some twenty alkaloids of opium, of which morphine and cocaine are considered the most important. Since 1935, the Surgeon General of the Army has been accepting and storing in reserve, stocks of opium or preparations thereof, suitable for medicinal use, which have been seized and confiscated by the authorities from illicit owners. At the present time, amounts received in this manner are considered sufficient for all military uses in time of emergency. Importation is controlled by the Narcotics Division of the Treasury and specific quotas are allotted to recognized importers.

## OPTICAL GLASS

Optical instruments such as field glasses, cameras, fire control and range

finding instruments, microscopes and lenses are essential equipment for the armed forces. Europe, and particularly Germany, had a monopoly on the industry up to the first World War, and although since that time, due to tariff protection, our domestic industry has grown until it now fills approximately 50 percent of our peace time needs, we cannot yet exclude imports. It was considered necessary to acquire war reserves, and the supply problem of any future emergency is thus minimized to the extent that present stocks on hand will meet requirements until production can be expanded.

## PHENOL

Phenol is a natural coal tar product and is also produced synthetically. Its chief use is in the manufacture of synthetic resins and plastics, and it is also used as an antiseptic, preservative, solvent, and in dyes and pharmaceuticals. Tendency in the plastics industry is to favor synthetic phenol, rather than natural phenol, and facilities are being developed for the manufacture of the former. For military purposes practically all the required phenol is for making picric acid. This acid may be made by the chlorobenzol method which, while it requires the same materials (benzene, sulphuric acid, nitric acid, caustic acid and chlorine) as does synthetic phenol, does not necessitate the actual phenol itself. The amount of phenol necessary would, therefore, depend on the method chosen for the manufacture of picric acid, for which there is no military substitute. In 1939 there was a total production in this country of 68,577,421 pounds of phenol.

Not only phenol itself, but all the other materials required for making ammonium picrate are available in the South.

## PLATINUM

Platinum is one of the rare and precious metals which has many uses in industry. The manufacture of sulphuric and nitric acids, laboratory instruments, electrical contacts, and functions in the dental and jewelry industries are its main uses. National output was 49,380 ounces in 1938, showing a remarkable gain in recent years. In case of emergency, there is still a small supply on hand which was accumulated in the first World War, and it is believed that a substantial amount could be obtained from jewelry in this country.

## TANNING MATERIALS

The most important natural sources of tanning materials are chestnut and quebracho woods; oak, hemlock, wattle, mangrove, and larch barks; sumac leaves, and conaigne roots. Of these, all except quebracho, wattle and mangrove are in-

digenous to the United States. Tanning extracts are prepared by leeching these, and a few other, materials in hot water and condensing the resulting liquor either until it contains 25% tannin or until it is reduced to a solid or powder form. Domestic consumption is estimated at 500,000,000 pounds annually, of which about half is imported, mainly from Argentina and Paraguay. Continuous research is being conducted towards a satisfactory substitute for the natural product, but results so far have not proved satisfactory.

## TOLUOL

Toluol ( $\text{CH}_3\text{C}_6\text{H}_5$ ) is a clear transparent liquid which may be obtained from bituminous coal and petroleum and therefore is definitely a potential southern manufacture since the South produces a large percentage of this country's coal and petroleum. The peace time supply is obtained entirely from by-product coke ovens, and production naturally follows the trend of pig iron production. The military purpose is for the manufacture of T. N. T., which is made by nitrating toluol. Since very little is used for this purpose now, peace time production probably never will be able to meet war time demands, except by expansion of production. Approximately 15,000,000 gallons a year are used as a solvent besides about 5,000,000 gallons in the manufacture of chemicals and in an emergency this could be replaced by high aromatic material obtained from petroleum.

## VANADIUM

Vanadium is used as an alloy with steel and copper, and the salts are used as mordants in dyeing. In 1938 the United States became the world's largest producer, with 1,613,155 pounds from all types of vanadium ores. Despite the rapid increase over previous totals, imports for consumption increased to 1,384,320 pounds. This element is found in commercial quantities only in about four countries, of which Peru is normally the main source of supply. Vanadium is found principally in carnotite, patronite, roscolite and vanadinite ores.

## WOOL

The principal military uses of wool are in the manufacture of clothing, blankets, felt, horse equipment, bunting and flannel. In 1939 we imported 98,193,000 pounds of apparel wool, while domestic production totaled 441,897,000 pounds. At least 90 days are required to convert raw wool into cloth for uniforms, unless there is a store of woollen cloth on hand. Means are being considered for building up this reserve, which could be rotated in peace time by current military use.

# THE COTTON CEMENT SHINGLE

BY  
Gene Holcomb

THE cotton-cement shingle first offered the building trade as a commercial product in July 1940 has found itself the subject of much publicity and two predictions.

A number of construction engineers (apparently aware of the improvements as shown by tests and experimental jobs) agree that public acceptance will be prompt. The product evidently will free roof designing from numerous construction restrictions.

Composed of an unevenly proportioned cement mix embedded with a cotton fabric aggregate and temporarily covered with an impervious wax paper, the material succeeds in two important departures from the usual in roofing materials. First, it is manufactured on the building site and laid wet, ten or fifteen minutes after making; second, it is cured on the roof in the position in which it will function. The result, as revealed by laboratory test and commercial application, is a strength and working flexibility heretofore unclaimed for cement or other types of roofing materials.

Wet shingles, like any bonded wet cement mix, lend themselves advantageously to handling. Flexible, they eliminate the necessity for metal flashing and ridge roll and can be laid over either new, smooth sheathing or old, uneven cedar shingles. In either case (though new sheathing is of course preferable) they lay extremely close together and conform so snugly that water seepage is prohibited. A working flexibility also permits both an over-lap (10 inches) and a side-lap (2½ inches), thereby accomplishing a hitherto unattainable 100 per cent bearing surface.

While curing, the shingle-like slabs bond naturally, something other roofing materials cannot do. This bonding is important, in that it results in a water resistance sufficient to support the 100 per cent bearing surface in producing a roof

that is so nearly indestructible by water, wind, fire, and hail that it has been given the lowest possible insurance rating, that of cement tile. In addition, nails driven into the wet mortar are bonded over, making it impossible for them to work out and eliminating the necessity of replacing them from time to time.

After the shingles have been applied green, with the impervious paper side exposed, they are left to cure, a natural process requiring approximately 28 days. During this period, the cotton aggregate performs a dual service: (1) It acts as a binder holding the mortar together; (2) Its innumerable fibers absorb the water of the mix like so many tiny wicks. Since only a small portion of the mixture is permitted to reach the surface and evaporate, the shingles do not become dry or brittle. After curing, the material's absorption ratio, as tested by the U. S. Bureau of Standards, is 6 to 8, a ratio so low that it reduces roof expansion by approximately 40 per cent. At the end of the curing period a workman strips the wax paper from the shingles, revealing a roof that has the pleasant feel of highly compressed rubber.

The process of manufacturing is relatively simple. The cement mix, consisting of one part cement, two parts sand, and one part water, is prepared in a small orthodox mixer. Since the vibrating machine, upon which the molded cement is to be placed, will distort the properties of gray cement, permitting it to cure white, this much cheaper grade is as serviceable as the more expensive grade. However, the water ratio is such that it sets up a 9,000 pound cement—2,000 pounds greater than that heretofore considered excellent. If building specifications designate a specific color or combination of colors, the coloring matter is added to the mix.

After mixing, the mortar is placed in a form lined with impervious wax paper. The form may be designed to produce a shingle, slate, or thatch effect. The amount of mortar placed in a form is dependent upon the predetermined weight

of the roof, which can be regulated to within a pound or two per square. Weights offered to contractors vary from 180 pounds per square to 2,000 pounds per square, the latter an amount unlikely to be requested.

From the molding table the mix is placed on a vibrating table that has been adjusted at the rate of 5,000 impulses a minute. Here the cement is made compact and deprived of voids or air bubbles. Here, also, the cotton fabric (closely resembling a rectangular strip of citrus bagging) is embedded in the mortar under hand pressure and smoothly covered over. When the form leaves the vibrating table a 15-pound felt base is placed over the mortar and edges folded over to seal the mixture. The material is then placed on an ordinary metal palette and hoisted to the house top, where it is applied immediately, felt base down, impervious paper up.

Tests of the material manufactured, applied, and cured in the above manner have been made by the New Uses Division of the Department of Agriculture, the U. S. Bureau of Standards, and the Portland Cement Association. In the Chicago laboratory of the Portland Cement Association a number of shingles were given a test equal to 100 years of service and pronounced as good at the end of that time as when started. Dr. Clarence Dorman, Director of Agricultural Research, Mississippi State College, has repeatedly tested the forms and vibrating machine for perfect adjustment, as well as the finished material for strength, absorption, and durability.

The roofing was invented by J. Harris Hardy, a cotton planter of Columbus, Miss., assisted by the Cotton Division of the Department of Agriculture, by construction engineers connected with the Portland Cement Association, and by the Department of Agricultural Research, Mississippi State College. Manufacturing rights are controlled by the Cotton Concrete Construction Company.



*Laying thin slabs of concrete reinforced with cotton as roof shingles. The slabs are laid wet and cured in place on the roof.*



# TAX CONTROL IN EAST TEXAS

**N**EW industries are continually knocking at our door. The trend toward location of plants in the South is already established and accepted. We only have to take advantage of that and help it by recognizing it, by rendering assistance in any way we can and by removing obstacles of our own making. Each state should examine its laws—and particularly its tax laws—to see that industry is not hampered or discouraged from coming here.”—Excerpt from an address by R. L. Gould, Treasurer of MANUFACTURERS RECORD, at a recent meeting called in Atlanta, Ga., by Gov. Rivers of Georgia, to mobilize the South’s industrial resources for defense.

Recognizing the established trend of industries toward the entire South area, and particularly toward East Texas—a section of the South which possesses many natural advantages for industrial development—the East Texas Chamber of Commerce two years ago launched a program to accomplish specifically the thing recommended by Mr. Gould in his Atlanta address.

Spectacular success has been accomplished—a measure of success which has attracted national attention, and which has brought many inquiries from every section of the nation as to the methods pursued by this organization in its tax control work.

In Texas, business and industry are chiefly concerned with ad valorem taxes, which account for 85 cents out of each dollar the average taxpayer contributes directly to State and local governments. Heaviest burden of taxation, obviously, comes from ad valorem taxes imposed by county, school district, municipal and special improvement districts, of which there are about 9,000 in the state, and more than 5,000 in East Texas, all authorized to levy taxes and issue bonds.

Two years ago, Hubert M. Harrison, vice president and general manager of the East Texas Chamber of Commerce, a regional organization serving 70 East Texas counties, determined to do something about this local tax situation, to the end that business, industry, and agriculture might be encouraged to expand and develop in East Texas. This territory includes about one-half the population of Texas, more than half the total wealth, and many advantages which naturally appeal to industry.

Harrison organized the Chamber’s Tax Department, placing in charge Curtis Morris, a competent staff tax expert. From the outset, the Chamber’s tax policy has been soundly based upon principles of cooperation with local taxpayers’

BY  
**Julian Capers, Jr.;**  
*East Texas Chamber of Commerce*

groups, and local public officials. Carefully avoiding any semblance of entanglement in local political brawls, and keeping strictly away from personal candidates, Morris rapidly gained the confidence of the county officials.

The method is simple, but effective. Morris goes into a county, discusses the tax situation with local community leaders representing every section of the county under study, enlists their support, and then makes a “tax survey” of the county. These “surveys” are simply-worded documents, quite different from the usual formal report produced by an auditor. They set forth in easily understandable form the essential facts about the county’s fiscal affairs. Elemental factors, such as tax valuations for a period of years, tax rates, revenue raised, delinquent taxes, total expenditures and the purposes for which the money was spent, bonded and “scrip” debt, and similar factors are set forth. After a few minutes of study, any farmer or small businessman can readily get a true picture of his county’s financial condition from one of these “surveys.” Morris then makes recommendations and

*Hubert M. Harrison, vice president and general manager of the East Texas Chamber of Commerce, whose tax control program was responsible for 24 East Texas counties reducing their tax rates last year.*



suggestions for improving efficiency, and saving tax money.

One of the principal weaknesses of county government in East Texas, he found, was a lack of budgetary control. The state law requiring adoption of a budget annually was more generally ignored than obeyed, he discovered, and as a result, finances of many counties were in a chaotic condition, with the county officials in many cases actually not knowing how much money the county owed.

The East Texas Chamber, enlisting the aid of prominent civic leaders in most communities in the area, launched a campaign to obtain preparation and adoption of a legal county budget in every county in the area. Public hearings were held on these budgets, and, armed with the information supplied by the Tax Surveys, citizens asked questions, made suggestions, and recommended methods calculated to increase efficiency and lower governmental costs.

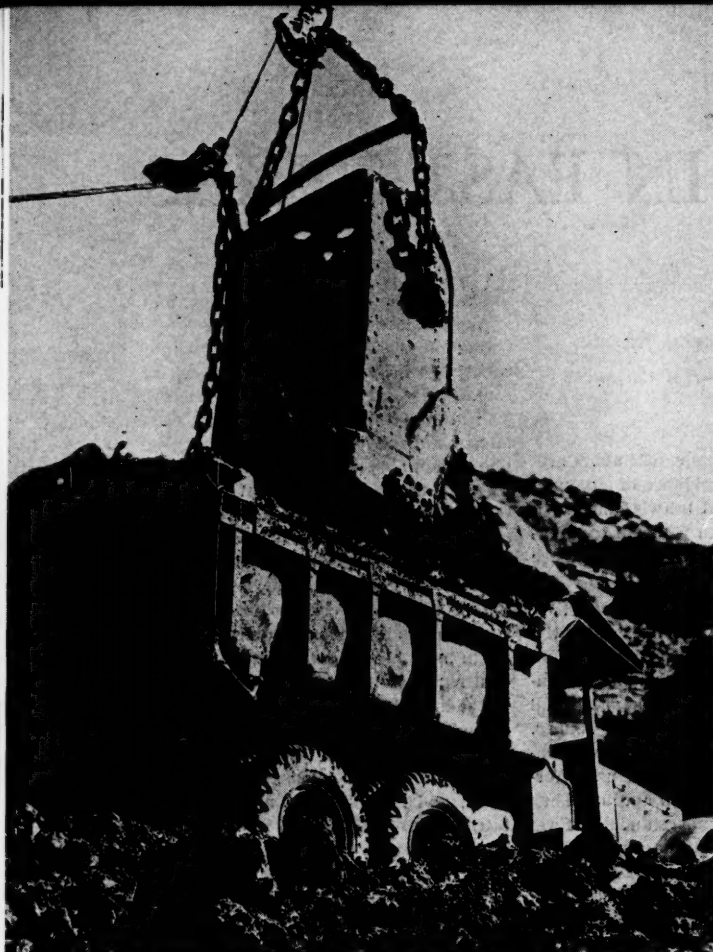
After a year of intensive work, results began to be apparent. Last year, for the first time in history, every one of the 70 East Texas counties adopted and operated on a legal budget; twenty-four counties reduced their tax rates, the cuts ranging from two cents to 50 cents on the \$100 of valuation; only three counties found it necessary to raise their tax rates; and forty-three counties held their rates at the same level as the previous year, despite an increased demand for relief, WPA matching funds, hospitalization, and other services necessitated by abnormal business conditions.

This year, Morris and his aides have made complete tax surveys in 68 of the 70 counties, and budget hearings are in progress throughout the area, as this article is written. Tentative tax rates, which will be formally adopted in the fall, already indicate reductions in more than 25 counties again this year, with a resulting saving of millions of dollars in tax money, to all taxpayers in the affected counties.

“The county officials in East Texas have been loudest in their praise of our program,” said Mr. Harrison, “because they have found that efficient, economical government is the best kind of politics. In Texas, our County Judges act both as administrative heads of the county governments, and also serve as Probate Judges. This means they usually are lawyers. Frequently, they are young attorneys, whose practice and experience have not brought them into contact with large fiscal operations, and the county’s management often is the largest single business enterprise in

*(Continued on page 43)*





*The quality and dependability of American industrial products will be an important factor in our defense program.*

BY  
F. L. Spangler

OUR most priceless treasure is the freedom and liberty which we enjoy—the right of suffrage, freedom of worship, equality of all under law. These privileges are worth more than all our gold and silver. Without them America is no longer America. They must be defended at all cost. And what will be the main line of defense? The cauldron of war across the Atlantic gives but one answer—a prepared industry, one that is ready in every particular to back up our mighty arms of defense.

But can't American industry, at a drop of the hat, turn out munitions, tanks, guns, airplanes, and ships by such huge tonnages as to engulf any attacking combination of world powers? On paper perhaps. But in reality, no. That's because American industry, by and large, is still thinking in terms of units of sales and costs. A war-prepared industry thinks only in terms of output. Until industry becomes imbued with this new attitude, it is not ready for the supreme test.

American industry must be prepared to do the "impossible" task. It must be ready to meet the "impossible" situation.

But outside of a few industries (the automobile industry being a conspicuous example) who have done it, there are few who recognize the unlimited potentialities of American industry.

What is the chief requirement of an industry prepared for the supreme test? It is to produce the greatest output in the shortest possible time. Quantity and speed are the key words. To attain these ends, industry already knows how to apply precision tools to mass production methods. But that alone is not enough. These ends must be attained without depleting the labor market. With several million unemployed on our hands, that may sound laughable. But is it? Labor statistics show that for every one million men employed in our factories, six million more are needed in other occupations as necessary adjuncts to factory output. These six millions include employees of transportation services, mines, insurance companies, professional men, and others.

So, if industrial employment is boosted by a mere two million men, twelve million more must be found somewhere. And don't forget that several millions of today's unemployed can never again be rehabilitated for industry or any other kind of employment.

Where shall we look for workers? Industry itself holds the key to the answer.

# INDUSTRY MUST MEET THE CHALLENGE OF WAR

Industry will have to be mechanized to the nth degree. In addition, it must find ways of keeping equipment running with smaller repair crews, so that more men will be available for productive work. This situation can be met by using better quality machines and materials. No super-intelligence is needed. Even with such unobtrusive materials and equipment as wire rope, bearings, valves, and gears, wise selection can greatly reduce the amount of time spent on repairs and replacements.

Of wire rope alone, \$40,000,000 worth is purchased every year by American industry. But here and there we find evidence that proper attention has not been given to rope selection. As a result, millions of hours of productive time is wasted in those many establishments employing cranes, elevators, hoists, shovels, drag lines, diggers, bulldozers, and other cable-operated equipment.

If a machine uses a  $\frac{3}{8}$ -in. hoist rope, it is not enough to pick just any rope of this size. Even if a 6 x 19 rope be standardized on, it is a mistake to suppose that all 6 x 19 ropes will give the same service or provide the same ease of replacement.

Proper rope selection saves labor in two ways: It reduces frequency of rope replacement by increasing rope life, and it speeds up the time required for replacement. Preformed rope, for example, offers a high resistance to fatigue, which gives it a greater service life in those installations where it must operate frequently over sheaves and drums. Also, it is quickly and easily taken off and replaced with new rope because it handles easily, without crankiness and with no tendency to loop and kink, and it generally requires no applications of seizings on its ends. Such savings are much greater than they may at first seem. In fact, many plants have reduced their maintenance hours and kept their equipment operating more continuously by using preformed

(Continued on page 43)

# U. S. EXPORTS OF MACHINERY

UNITED STATES exports of industrial machinery in June amounted to \$35,694,943, nearly sixty per cent above the corresponding 1939 total of \$22,573,175, according to the Machinery Division of the Department of Commerce. Compared with the previous month, in which the total was \$36,682,663, June exports of power generating machinery, construction and conveying machinery, and textile, sewing, and shoe machinery increased in varying degrees, while exports of metal-working machinery, mining, well, and pumping machinery, and of "other industrial machinery" showed small declines.

Total exports of power generating machinery, excluding electrical, were valued at \$2,126,581 in June, a thirty per cent increase over May shipments, which were valued at \$1,633,174. Diesel and semi-diesel engines valued at \$439,779 were exported during June, as against \$368,667 in May; June exports of other internal combustion engines totalled \$623,232, compared with \$328,171 in May; steam boilers valued at \$194,004 were shipped abroad in June compared with \$36,881 in May.

June export trade in construction and conveying equipment totalled \$2,119,719, an increase of seven per cent over the previous month, valued at \$2,022,010. Increases were recorded for excavators and parts, with June shipments valued at \$1,118,660 as against \$435,730 in May, and for conveying equipment and parts, with exports in June amounting to \$419,694 compared with \$217,825 in May. Grader and scraper exports were down to \$551,343 from \$673,841 in the previous month; shipments of cranes, hoists, and derricks were valued at \$243,474 in June, as against \$373,976 in May.

Little change was noted in exports classified as "other industrial machinery." June shipments being valued at \$5,363,648, as against \$5,940,006 in May. Exports of sugar mill machinery amounted to \$198,749, as against \$189,359 in May; shipments of ball and roller bearings amounted to \$638,873, an increase over the May figure, which was \$447,780; air compressor exports, valued at \$347,415 in June, were about the same as the previous month's shipments of \$340,619; exports of valves were valued at \$384,231,

as against \$334,986 in May; and wood-working machinery worth \$243,021 was shipped in June against the May figure of \$160,421.

United States exports of farm equipment during June totalled \$7,179,482, a decline of two per cent from shipments in June, 1939, which amounted to \$7,334,077, the Machinery Division of the Department of Commerce states. Exports of tillage implements were somewhat higher than a year ago, while shipments of tractors and their parts and accessories were practically unchanged. However, declines in other export classes more than offset the gain in tillage implements.

United States exports in tractors, parts, and accessories amounted to \$4,414,809 in June, about the same as the comparable trade in June 1939 which totalled \$4,387,011. Shipments of wheel tractors were up eleven per cent to \$1,723,866 from the June 1939 total of \$1,552,742.

Exports of tracklaying tractors declined to \$1,764,543 in June 1940 from \$1,948,254 in the same month of last year. Shipments of carburetor-type tracklaying tractors were down thirty per cent, to \$414,462 from \$592,099 in June, 1939, while exports of fuel-injection type tracklaying tractors showed little change, amounting to \$1,350,081 in June 1940 compared with \$1,356,155 in June 1939. Exports were spread over the three export size classes in each group; carburetor-type—under 35 drawbar hp., \$206,660 against \$497,798 a year ago; 35-59 hp., \$133,574 against \$62,585; 60 and over hp., \$74,228 against \$31,716; fuel-injection type—under 35 drawbar hp., \$461,755 against \$228,978; 35-59 hp., \$322,235 against \$495,983; 60 and over hp., \$566,091 against \$631,194. Exports of tractor parts and accessories were up five per cent in June compared with June 1939, to \$926,400 from \$886,015.

June exports of tillage implements, totaling \$788,038, were forty-three percent greater than in June, 1939, when the trade amounted to \$550,760. Shipments of plows advanced to \$276,504 from \$194,134 in June, 1939, and harrows to \$73,787 from \$51,182. Reduced shipments were recorded in two classes of this equipment, exports of cultivators declining to \$78,473 from \$89,558 a year ago, and planters

to \$50,694 from \$57,013. However, gains were made in foreign sales of drills and seeders, \$22,555 against \$18,855, and in all other types of tillage implements, \$285,825 compared with \$140,018.

A substantial reduction in shipments abroad of harvesting machinery and other types of farm equipment occurred, dropping to \$1,976,635 from \$2,396,306, a decline of approximately eighteen per cent. Gains were registered in hay-rakes and tedders, feed cutters and grinders, and poultry equipment; harvesters and binders remained nearly stationary; and declines occurred in combine harvesters, seed separators, bee-keeping equipment, dairy equipment, sprayers and dusters, windmills and parts, hay presses, and other agricultural machinery and parts.

## The Dead Hand of Bureaucracy

Ten years ago Lawrence Sullivan a commentator on government affairs, began an exhaustive study of bureaucracy as it has developed and now exists in the Federal Government. With little idea of the way bureaucracy would grow in the ten years, Sullivan found a full time job on his hands. He calls bureaucracy "representative government suffering a nervous breakdown" and clearly shows how its workings impose crippling restraints upon business and slows down the whole economic life of the country. In this book is found an exciting defense of the American system of private enterprise.

The author has lived intimately with bureaucracy for fifteen years and has known the legislative and administrative labyrinths of Washington under five Presidents.

He believes that the collapse of private enterprise will bring about some European pattern of totalitarianism in this country and that the government's recent record is gradually bringing us toward this end. "In any engagement with federal bureaucracy," says the writer, "the individual is hopelessly outflanked."

Exhaustive instances and evidence throughout the book leads him to the conclusion that "American bureaucracy has developed its own techniques of terror and tyranny. Crossed, it can move against a citizen like an angry monarch."

To those who believe the great issue of the day is between managed economy, or national planning under the guidance of bureaucracy, and private enterprise under general laws designed to curb individual abuses of economic power, this book is a valuable contribution. It will serve to refresh the mind as to the happenings of the last ten years.

The Dead Hand of Bureaucracy by Lawrence Sullivan. 303 pages. Bobbs-Merrill Co., \$2.50.

# National Defense Program Awards in the South

ALABAMA			
Unit	Manufacturer	Item	Amount
Ordnance	Kilby Steel Co.—Anniston	Forging, shell, etc.	\$113,228.62
Qtmtr. Corps	Carless Well Supply Co.—Memphis, Tenn.	Testwells—Southeast Air Depot	11,500.00
"	Kilby Steel Co.—Anniston	Mosquito bar rods	59,970.00
"	A. J. Honeycutt Co.—Birmingham	Constr. of officers quarters, MacDill Field	71,464.00
"	Chicago Bridge & Iron Co., Birmingham	Elevated Steel Tank, Piping & Accessories, MacDill Field, Tampa, Fla.	39,175.00
Supplies & Accts.	Gardiner Warring Co.—Florence	Cotton-wool undershirts	39,500.00
Yards & Docks	Hardie-Tynes Mfg. Co., Birmingham	Two air compressors, Navy Yard, Brooklyn	47,300.00
WPA	Construction of barracks	(Army) Montgomery	213,183.00
"	Camp site and gunnery base	(Nat'l Guard) Dauphin Island	50,104.00
"	Construction, improvement, utilities	(Army) South East Air Depot, Mobile	145,482.00
"	Construction of barracks and buildings	(Army) Selma	273,181.00
"	Construct State Arsenal	(Nat'l Guard) near Kilby Prison	12,966.00
"	Approximate allocation from \$25,000,000 TVA National Defense appropriation, for two additional electric generating units at Wilson Dam		3,000,000.00
FLORIDA			
Qtmtr. Corps	A. J. Honeycutt Co.—Birmingham, Ala.	Constr. of Q. M. Maintenance, Q. M. Warehouse, Signal Corps Warehouse, Q. M. Warehouse and Commissary, MacDill Field	153,765.00
"	Ebersbach Constr. Co.—Tampa	Runway, MacDill Field	630,272.00
"	Ryan Constr. Co.—Tampa	Oil Storage and dispensing system—MacDill Field	10,830.00
"	Chicago Bridge & Iron Co., Birmingham, Ala.	Elevated Steel Tank, Piping & Accessories, MacDill Field, Tampa	39,175.00
"	Watt & Sinclair of Florida, Inc., Palm Beach	Temporary Buildings at Orlando Airport	155,130.00
"	Ward Construction Co., Tampa	Temporary barracks and mess buildings at Orlando Airport	137,700.00
"	Foster & Creighton Co., Inc., Nashville, Tenn.	Depot Supply Bldg. and Engine Repair Shop for Southeast Air Depot, Mobile	1,433,400.00
"	Central Contracting Co., Atlanta, Ga.	Hangars, MacDill Field	1,065,500.00
Yards & Docks	Doyle & Russell—Richmond, Virginia	Superstructure of repair shop Naval Air Station, Jacksonville	772,160.00
"	E. & E. J. Pfozter, Phila., Pa.	Building—Naval Air Station, Pensacola, Fla.	108,335.00
"	Merritt-Chapman & Scott—N. Y. C.	Moorings—Key West, Naval Station	10,964.00
"	Construction, utilities, roads	(Army) Fort Barrancas, Pensacola	50,000.00
"	Construction, utilities, roads	(Navy) Naval Air Station, Pensacola	700,000.00
"	Construction loan for 200 dwelling units	Moreno Court—near Corry Field—Pensacola	715,000.00
"	Smith Engineering & Construction Co., Pensacola	Roads & Walks, Naval Air Station, Pensacola	34,475.00
"	Industrial Htg. & Engineering Co., Milwaukee, Wis.	Heating system for new hangars, Naval Air Station, Sautley Field, Pensacola	16,500.00
WPA	Improve Municipal Airport	St. Augustine	21,196.00
"	Complete National Guard Armory	Winterhaven	30,128.00
"	Construct Army Air Base at Southeastern Air Base	Tampa	1,158,943.00
"	Construct and improve facilities at Elgin Field	(Army)	21,347.00
Supplies & Accts.	The Glidden Co., Naval Stores Division, Jacksonville	Rosin, lump	9,710.26
GEORGIA			
Qtmtr. Corps	Peerless Woolen Mills—Rossville	Wool blankets, O. D.	150,000.00
Supplies & Accts.	Central Contracting Co., Atlanta	Hangars, MacDill Field, Florida	1,065,500.00
"	Scripto Mfg. Co.—Atlanta	Erasers, lead and pencils	12,105.41
"	Muscogee Mfg. Co.—Columbus	Turkish towels	17,923.20
WPA	Construction, Utilities, roads	Fort Benning including Lawson Field	750,000.00
"	Construct and improve buildings and facilities at Fort Oglethorpe	(Army)	10,000.00
"	Construct and improve buildings and facilities at Fort McPherson	(Army)	10,000.00
"	Construction loan for 614 dwelling units Columbus—near Fort Benning		2,024,000.00
KENTUCKY			
Ordnance	Henry Vogt Machine Co.—Louisville	Machining, shell, etc.	185,155.85
"	Reynolds Metal Co., Louisville	Aluminum, alloy rod	15,428.00
Qtmtr. Corps	Kane Mfg. Co.—Louisville	Khaki trousers	14,400.00
Chemical Warfare	Reynolds Metals Co.—Louisville	Aluminum	5,425.92
Yards & Docks	The Murphy Elevator Co.—Louisville	Freight elevator in Naval Hospital—Phila., Pa.	13,400.00
"	Construction, utilities, roads	(Army) Fort Knox and Godman Field	750,000.00
LOUISIANA			
Corps of Engrs.	Fulton Bag & Cotton Mills, New Orleans	Burlap bags	9,400.00
Supplies & Accts.	Higgins Industries, Inc.—New Orleans	Small boats	856,406.00



"	"	Construction, utilities, roads .....	
"	"	Jefferson Lake Sulphur Co., Inc., New Orleans .....	

#### MARYLAND

Qtmtr. Corps	"	Casey Jones, Inc.—Baltimore .....	
"	"	Shirtcraft Co., Inc.—Baltimore .....	
Chemical Warfare	"	H. J. Gettemuller Co.—Baltimore .....	
"	"	Dependable Motor Trans. Co.—Baltimore .....	
"	"	John K. Ruff Co.—Baltimore .....	
"	"	John K. Ruff Co.—Baltimore .....	
"	"	Federal Tin Co.—Baltimore .....	
"	"	R. F. Leslie, Port Deposit .....	
"	"	Federated Metals Div., American Smelting & Refining Co., Baltimore .....	
Ordnance	"	Revere Copper & Brass, Inc., Baltimore .....	
Yards & Docks	"	McCloskey & Co., Philadelphia, Pa. ....	
"	"	Irwin & Leighton, Philadelphia, Pa. ....	

Supplies & Accts.	"	H. M. Wagner & Co., Inc.—Baltimore .....	
"	"	The Maryland Drydock Co.—Baltimore .....	
"	"	Washburn Crosby Co.—Baltimore .....	
"	"	Construction, utilities, roads .....	
"	"	Construction, utilities, roads .....	
"	"	Construction, utilities, roads .....	
"	"	Construction, utilities, roads .....	
"	"	Winslow-Knickerbocker Coal Co., Baltimore .....	
"	"	Jenkins & McCall Coal Co., Frostburg .....	
"	"	Revere Copper & Brass Co., Inc. ....	
WPA	"	Improve facilities at Municipal Airport .....	
"	"	Maryland Drydock Company, Baltimore .....	

#### MISSISSIPPI

WPA	"	Complete Construction of Airport Hangar .....	
"	"	Improvements to Airport .....	
"	"	Ingalls Shipbuilding Corp., Birmingham (Pascagoula, Miss., yard) .....	

#### MISSOURI

Qtmtr. Corps	"	(Instruction to purchase approximately 3,700 horses and 2,000 mules in the open market—approximate value \$950,000.00) .....	
"	"	Kirk Building Co.—Kansas City .....	
"	"	Premium Cap Co.—St. Louis .....	
"	"	Rice-Stix Dry Goods Co.—St. Louis .....	
"	"	L-C-E Mfg. Co.—Kansas City .....	
"	"	Brown Shoe Co., Inc., St. Louis .....	
"	"	International Shoe Co., St. Louis .....	
"	"	Royal Bedding Co., St. Louis .....	
"	"	International Shoe Co., St. Louis .....	
"	"	Neevel Mfg. Co., Kansas City .....	
"	"	Herkert & Meisel Trunk Co., St. Louis .....	
Supplies & Accts.	"	Midwest Piping & Supply Co.—St. Louis .....	
"	"	Sheffield Steel Corp., Kansas City .....	
"	"	C. Hager & Sons, Hinge Mfg. Co., St. Louis .....	
Corps of Engrs.	"	Bemis Bros. Bag Co., St. Louis .....	
Ordnance	"	Monsanto Chemical Co., St. Louis .....	

#### NORTH CAROLINA

Qtmtr. Corps	"	The Corbitt Co., Henderson .....	
"	"	Chatham Manufacturing Co.—Elkin .....	
"	"	Cramerton Mills, Inc.—Cramerton .....	
Supplies & Accts.	"	Thomas Mills, Inc.—High Point .....	
"	"	R. J. Reynolds Tobacco Co., Winston-Salem .....	
Yards & Docks	"	V. P. Loftis—Charlotte .....	
"	"	Charles W. Angle, Inc., Greensboro .....	
"	"	Construction, utilities, roads .....	
Corps of Engrs.	"	Wertheimer Bag Co., Wilmington .....	

#### OKLAHOMA

Qtmtr. Corps	"	Manhattan Constr. Co., Muskogee .....	
"	"	Construction, utilities, roads .....	
WPA	"	Construct and improve buildings, grounds and facilities .....	

#### SOUTH CAROLINA

Yards & Docks	"	Layne-Atlantic Co., Norfolk, Va. ....	
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(Continued on page 52)

(Army) Barksdale Field .....	200,000.00
Sulphur .....	42,720.00

Work suits .....	\$25,900.00
Khaki trousers .....	14,535.00
Lacquer and solvent .....	14,134.50
Bus service .....	18,768.00
Shop Building and Ordnance School—Aberdeen .....	177,700.00
Hospital alterations, Fort Monroe, Virginia .....	73,880.00
Metal and dies .....	40,658.19
Truck service .....	27,724.00

Supplies .....	42,400.00
Ammunition parts .....	855,233.00
Additional buildings & accessories, Naval Academy, Annapolis .....	1,210,000.00
Alterations to Fourth Wing, Bancroft Hall, Naval Academy, Annapolis .....	107,770.00
Sugar .....	25,164.50
Conversion of USS Mattole .....	523,847.00
Flour .....	15,674.93
(Army) Fort George G. Meade .....	200,000.00
(Army) Aberdeen Proving Ground .....	100,000.00
(Army) Baltimore—Holabird Qtmtr. Depot .....	200,000.00
(Army) Baltimore—Edgewood Arsenal .....	250,000.00
(Navy) Naval Academy including Radio Experiment Station .....	250,000.00
Coast Guard Depot .....	113,894.00
Coal .....	173,580.85
Coal, run of mine .....	42,911.00
Brass and copper .....	18,761.30
(Nat'l Guard) Baltimore .....	20,149.00
Recondition SS Edenton .....	121,426.00

Vicksburg Airport .....	8,807.00
Key Field Airport—Meridian .....	193,586.00

3 passenger - cargo vessels at \$4,000,000 .....	12,297,000.00
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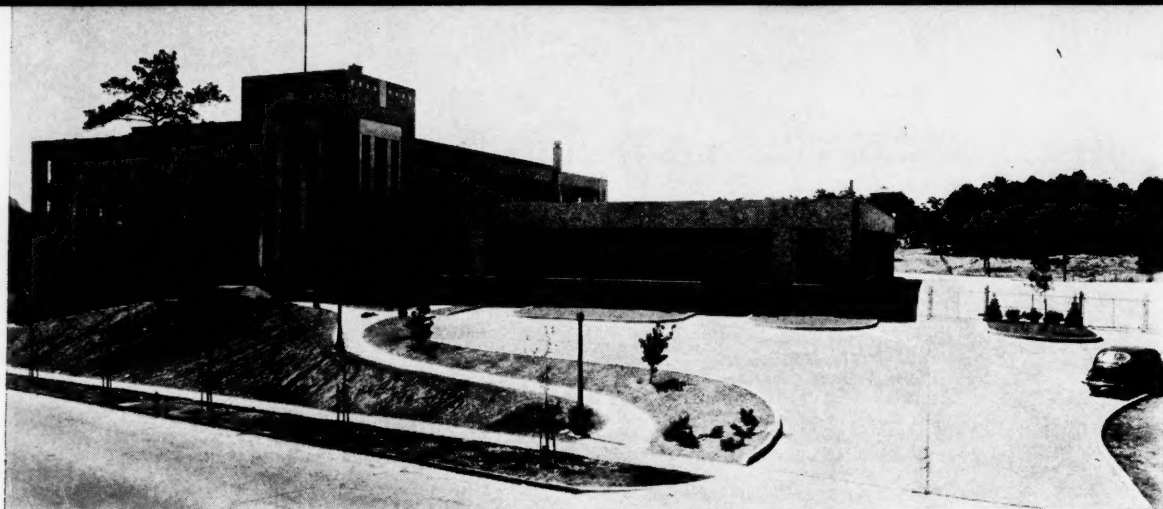
Repair Building, Patterson Field, Ohio .....	177,900.00
Barrack bags .....	16,920.00
Trunk lockers .....	35,525.00
Trunk lockers .....	150,798.86
Shoes, service .....	150,000.00
Shoes, service .....	235,606.32
Mattresses .....	18,600.00
Shoes, service .....	1,121,049.44
Trunk, lockers .....	79,000.00
Trunk, lockers .....	7,300.00
Machine, van stone, flanging .....	16,595.00
Steel rivets .....	41,959.95
Hinges .....	36,137.60
Burlap bags .....	11,210.00
Ammunition parts .....	18,482.40

Trucks .....	1,395,267.69
Wool blankets, O. D. ....	449,250.00
Cotton cloth .....	190,593.65
Socks .....	21,528.00
Cigarettes .....	10,171.78
Hospital Building—Naval Hospital, Charleston, S. C. ....	44,835.00
Barracks—storage and aviation facilities, Marine barracks, Parris Island, S. C. ....	2,394,750.00
(Army) Fort Bragg .....	250,000.00
Burlap bags .....	28,870.00

Constr. Ammunition Magazines Savannah Ordnance Depot, Illinois .....	1,452,850.00
Fort Sill and Post Field .....	350,000.00
(Army) Reno QM Depot at El Reno .....	10,000.00

Water-well, Parris Island, S. C. ....	40,000.00
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## Southern Contracts Reach Peak Level for August

*explosive  
and plane  
industries  
construct  
new plants*

**N**ATIONAL Defense contracts continued to swell Southern construction totals, as awards during August for both military and industrial plants amounted to \$121,094,000, a figure higher than for any other August on record. Contracts let so far in 1940 point to a banner construction year, the \$666,684,000 total for the eight months representing the second largest accumulation during a similar period.

Private construction, while somewhat below that of July, in August stood at almost the identical level attained in the

*The \$500,000 distributing house completed about a month ago at Atlanta, Ga., by Western Electric Co., is shown above. Containing also a garage for Southern Bell Telephone & Telegraph trucks operating in the Atlanta area, the building was erected by Beers Construction Co., local contractor. It is of reinforced concrete, structural steel and brick construction and was designed by W. R. Kattelle, Western Electric architect.*

same month of 1939. Industrial contracts forged ahead to double the July figure. Governmental building, however, showed a drop, as no huge contracts such as that for the Corpus Christi naval air station were negotiated during August.

Engineering projects in the contract stage remained at practically the same level, as compared with the preceding month, with airports and river and harbor work contributing to this stability. Highway contracts pursued a downward course. The prospects in this field brightened as several States announced intentions to speed work on strategic roads. A \$75,000,000 program is being considered for Maryland under a proposal of the Public Roads Administration, with a \$30,000,000 east-west skyway projected through the City of Baltimore.

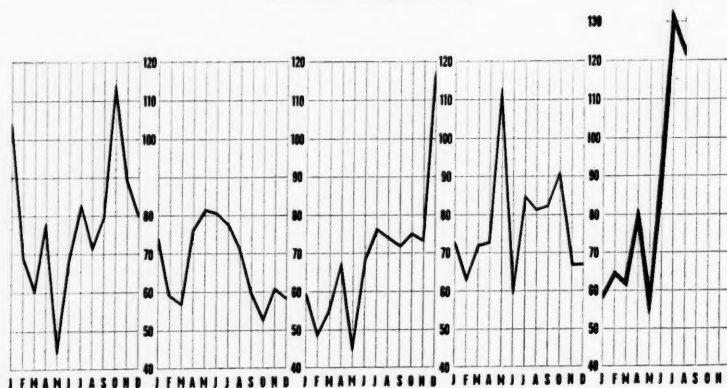
The \$42,465,000 total for August industrial contracts includes the \$25,000,000 powder plant to be built by the Hercules

*eight month  
contracts  
hit second  
highest peak*

Powder Co. on a War Department-owned site near Radford, in the mountainous section of inland Virginia. This is the third gigantic explosives factory announced in recent months for the South and contiguous territory. The first is a similarly sized plant now being built at Millington,

### Southern Construction Trends by Months

(in millions of dollars)



MANUFACTURERS RECORD FOR

# Statistics of South's Construction

	August, 1940	Contracts to be Awarded	Contracts Awarded First Eight Months 1940	Contracts Awarded First Eight Months 1939	Contracts Awarded First Seven Months 1940*
<b>PRIVATE CONSTRUCTION</b>					
<b>BUILDING</b>					
Assembly (Churches, Theatres, Auditoriums, Fraternal)	\$1,747,000	\$2,619,000	\$13,806,000	\$11,264,000	\$12,059,000
Commercial (Stores, Restaurants, Filling Stations, Garages, etc.)	2,276,000	2,598,000	21,749,000	21,816,000	19,473,000
Residential (Apartments, Hotels, Dwellings)	6,890,000	2,902,000	69,411,000	67,958,000	62,521,000
Office	1,776,000	1,330,000	5,924,000	13,071,000	4,148,000
	\$12,689,000	\$9,449,000	\$110,890,000	\$114,109,000	\$98,201,000
<b>INDUSTRIAL</b>	\$12,465,000	\$157,049,000	\$139,739,000	\$71,053,000	\$97,274,000
<b>PUBLIC CONSTRUCTION</b>					
<b>BUILDING</b>					
City, County, State, Federal	\$22,696,000	\$23,116,000	\$141,596,000	\$92,152,000	\$118,900,000
Housing	12,887,000	33,881,000	63,255,000	32,744,000	50,368,000
Schools	3,773,000	15,624,000	16,627,000	32,954,000	12,854,000
<b>ENGINEERING</b>					
Dams, Drainage, Earthwork, Airports	\$39,336,000	\$72,621,000	\$221,478,000	\$197,850,000	\$182,122,000
Federal, County, Municipal Electric	\$5,951,000	\$8,580,000	\$44,870,000	\$46,219,000	\$38,919,000
Sewers and Waterworks	8,895,000	101,063,000	42,306,000	43,632,000	33,411,000
	1,606,000	11,157,000	7,491,000	21,733,000	5,885,000
	\$16,452,000	\$120,800,000	\$94,667,000	\$111,634,000	\$78,215,000
<b>ROADS STREETS AND BRIDGES</b>	\$10,132,000	\$23,189,000	\$99,910,000	\$124,269,000	\$89,778,000
<b>TOTAL</b>	\$121,094,000	\$383,108,000	\$666,684,000	\$618,915,000	\$545,590,000

\*Corrected Figures.

Tenn., by DuPont interests for the British government. The second, like the Radford plant, is a United States project being located in Indiana just across the Ohio River from Louisville, Ky.

Other developments in the explosive and related fields included a \$500,000 contract let by Shell Oil Co. for a \$500,000 plant at Houston, Texas, to annually produce two million gallons of toluene, T. N. T. ingredient. Atlas Powder Co. started work on a third unit at its plant near Joplin, Mo., and at the same time Solvay Process Co., subsidiary of Allied Dye & Chemical Co. prepared to restore its Hopewell, Va. plant for making sodium nitrate.

Carnegie Illinois Steel Corp., which is operating at the \$22,000,000 naval ordnance plant at South Charleston, W. Va., received a \$2,275,000 contract under which the corporation's facilities there will be greatly expanded.

Largest among the aircraft plant projects launched under the plan for industrial mobilization for defense was the \$6,500,000 factory to be constructed at Dallas, Texas by North American Aviation, Inc., of Inglewood, Calif. A plant of equal or larger proportions is scheduled to be built at St. Louis, Mo., by Curtiss-Wright Corp., under a Reconstruction Finance Corporation loan arrangement, which also covers units for Buffalo, N. Y., and Columbus, Ohio.

Glenn L. Martin Co., airplane manufacturer with one of the world's largest plants at Middle River, near Baltimore, is reported to be planning a \$24,000,000 expenditure for additional facilities, perhaps at a location farther toward the country's interior. Expansion to cost \$6,000,000 at the new Stinson plant, Nashville, Tenn., is to be carried out by Vultee Aircraft. Both are divisions of Aviation Manufacturing Corp. Babcock Aircraft Corp., Deland, Fla., is to build a \$125,000 plant.

A new aluminum producing enterprise appeared on the South's industrial horizon during August. It was Reynolds Metals Co., Inc., Richmond, Va., concern

which received a \$15,800,000 loan from the Reconstruction Finance Corporation for construction of a plant, probably in Alabama, to annually produce 20 million pounds of the metal so essential in aircraft manufacture. Aluminum Ore Co., Aluminum Company of America, subsidiary, announced that additions to be made at its Mobile, Ala., plant would raise the capacity there by 50 per cent.

The Tennessee Valley Authority publicized the start of work on the \$25,000,000 proposal to further develop the hydroelectric possibilities of the Tennessee Valley by construction of the Cherokee Dam on the Holston River; a 120,000-kilowatt steam plant near Watts Bar dam on the Tennessee River, and installation of additional generating capacity at Wilson dam, Alabama relic of World War days, and the more recently finished Pickwick Landing dam further up the Tennessee River near Savannah, Tenn.

Private power companies also took steps to prepare for increasing demands. The Virginia Electric & Power Co., Richmond, and the Virginia Public Service Co., of Alexandria, will spend more than \$6,000,000 for projects to insure adequate power supplies for the Hampton Roads area, where the No. 1 U. S. Naval base and one of the country's leading ship construction plants are located. This ship concern, the Newport News Shipbuilding and Dry Docks Co., recent builders of the America, queen of the American merchant marine, let the contract for a \$1,000,000 submerged shipway and a new \$475,000 pier.

Consolidated Gas, Electric Light and Power Co., Baltimore, is considering a \$300,000 building addition at its Madison Street operation, from which the big power plant project at Westport is being supervised. This company serves the area in which Bethlehem Steel Co. will expand its Key Highway ship repair facilities. The Bethlehem work includes a new wet basin, new pier construction and shop additions. Florida Power Corp. will make a \$1,000,000 extension at its St. Petersburg plant as part of a \$3,000,000 program.

Potomac Electric Power Co., Washington, D. C., let a big turbine and boiler order in connection with its expansion, as South Carolina Electric & Gas Co. proceeded on a \$1,200,000 expansion and improvement program.

Cessation of Scandinavian paper imports has resulted in proposals for revival of paper and pulp mill construction in the South. Two such projects are in view for south Georgia. C. H. Murdick, of Allied Industries, Inc., New York, is reported interested in establishment of a 150-ton pulp plant on the Alapaha River, near Valdosta. Surveys are also to be made on the possibility of locating a pulp and paper mill to the west of Valdosta on the Withlacoochee River. St. Marys Kraft Corp., of St. Marys, Ga., was incorporated with a \$1,000,000 authorized capital for the purpose of setting up a pulp and paper products plant.

In addition to the numerous and varied activities in the field of industrial endeavor, contracts were awarded and bids were opened for construction at a number of army posts and naval shore stations. The largest in Southern territory was a \$5,898,391 contract for storage structures, laboratories, processing plant and administration building at Edgewood Arsenal, north of Baltimore. Barracks at the Parris Island, S. C., marine base, which recently was so severely damaged by hurricane, were provided for in a \$2,349,750 award.

Camp Jackson, a South Carolina military establishment, will be the scene of work to cost \$2,193,000 under a newly let contract. Temporary buildings at Fort Benning, Ga., will involve \$606,790, while similar construction at Fort Knox, Ky., where the nation's gold vault is planted, will cost \$1,632,000. Power plants for the Charleston, S. C., and Philadelphia navy yards, and for the Parris Island barracks are covered under a \$1,260,000 navy contract.

The Naval Academy at Annapolis, Md., came in for a share of the construction, when a \$1,210,000 contract was let for

(Continued on page 57)

# New Industrial Plants and Expansions in the South During August, 1940

## Contracts Awarded

Ala., Anniston—Anniston Manufacturing Co.; weave shed ..	\$40,000
Ala., Birmingham—Southern Bell Telephone Co.; warehouse and office ..	70,000
Ala., Decatur—White Way Pure Milk Co.; plant ..	16,000
Ala., Guntersville—Lake View Chenille Co.; bedspread plant ..	
Ala., Mobile—Aluminum Company of America; equipment ..	
Ark., Eldorado—Lion Oil Refining Co.; refinery ..	
Fla., Fort Pierce—Fort Pierce Cooperative; packing plant ..	
Fla., Miami—Seaboard Airline Railway; diesel shop ..	39,000
Fla., Miami—Eli Witt Cigar & Tobacco Co.; warehouse ..	18,000
Fla., Panama—Boen W. Becton; cold storage plant ..	15,000
Ga., Camilla—Camilla Refrigeration Cooperative, Inc.; cold storage plant ..	
Ga., Macon—Elkan Stone Tile Company; plant ..	
Ga., Perry—Southeastern Telephone Co.; improvement program ..	18,000
Ga., Toccoa—Hartwell Mills; mill extension ..	
Ky., Louisville—Louisville Railway Co.; buses ..	700,000
La., Shreveport—H. L. Hunt; recycling plant ..	1,250,000
La., Shreveport—Louisiana & Arkansas-Kansas City Southern Lines; station ..	100,000
Md., Baltimore—Petrol Terminal Corp.; tanks ..	25,000
Md., Baltimore—Rustless Iron & Steel Corp.; air conditioning ..	
Md., Baltimore—Schludenberg-Kurdle Company; alterations and additions ..	25,000
Md., Baltimore—M. Waller Corp.; tanks ..	
Md., Bradshaw—A. C. Radziszewski (Archt.); factory ..	
Mo., Joplin—Atlas Powder Company; plant ..	
Mo., St. Louis—American Telephone & Telegraph Co.; carrier buildings ..	
Mo., St. Louis—Coca-Cola Bottling Co.; alteration and additions ..	25,000
Mo., St. Louis—Medart Company; factory addition ..	30,000
Mo., St. Louis—Monsanto Chemical Co.; turbine room addition ..	50,000
Mo., St. Louis—World Color Printing Co.; addition and equipment ..	150,000
Mo., Springfield—Southwestern Bell Telephone Co.; addition and alterations ..	
N. C., Charlotte—Horton Motor Lines; motor trucking equipment ..	200,000
N. C., Charlotte—Refining, Inc.; chemical plant ..	20,000
N. C., Charlotte—Granite Falls—Granite Falls Manufacturing Co.; extension ..	
N. C., Hickory—A. A. Shuford Mill Co.; mill addition ..	
N. C., Salisbury—Stanback Company; plant addition ..	
N. C., Shelby—Coca-Cola Bottling Co.; building ..	
S. C., Anderson—Appleton Company; addition ..	60,000
S. C., Anderson—Equinox Mill, Inc.; modernization ..	
S. C., Columbia—South Carolina Electric & Gas Co.; expansion program ..	1,200,000
S. C., Pelzer—Kendall Mills, Inc.; mill addition ..	
S. C., Pickens—Singer Manufacturing Co.; power plant ..	150,000
Tenn., Nashville—Neuhoff Packing Company; addition ..	24,000
Tenn., Alice—Davis Oil Company; recycling plant ..	
Tenn., Cisco—Banner Creamery Co.; plant ..	450,000
Tenn., Dallas—Haggard Company; pants plant ..	6,500,000
Tenn., Dallas—North American Aviation, Inc.; aircraft manufacturing plant ..	
Tenn., Fort Worth—Central Forwarding, Inc.; warehouse and terminal ..	30,000
Tenn., Fort Worth—Magnolia Petroleum Co.; gasoline pipe line ..	
Tenn., Houston—Leon Finch, Ltd.; paint plant ..	
Tenn., Houston—Pittsburgh Plate Glass Co.; office building ..	
Tenn., Houston—John A. Roebeling's Sons Co.; wire rope plant ..	36,000
Tenn., Houston—Shell Oil Company; toluene plant ..	500,000
Tenn., Lubbock—Ralston Purina Company; plant ..	
Tenn., Lubbock—Southwestern Bell Telephone Co.; addition ..	
Tenn., Lufkin—Mid-Co Products Co.; clay products plant ..	50,000
Tenn., McKinney—Collins County Milk Products Co.; plant ..	20,000
Tenn., Pasadena—W. Clearley & Sons; granite plant ..	50,000
Tenn., Port Arthur—Bayonne Steel Barrel Co.; plant ..	
Tenn., San Antonio—Henry Deutz; cold storage locker plant ..	110,000
Tenn., San Antonio—Richter's Bakery; bakery ..	30,212
Tenn., Seymour—Baylor Electric Company; generating plant ..	
Va., Ballston—Washington, Virginia & Maryland Coach Co.; terminal ..	175,000
Va., Luray—Luray Textile Corp.; mill building ..	74,000
Va., Lynchburg—Mead Corporation; expansion ..	
Va., Newport News—Newport News Shipbuilding & Dry Dock Co.; pier ..	475,000
Va., Newport News—Newport News Shipbuilding & Dry Dock Co.; dry dock ..	1,000,000
Va., Radford—Burlington Mills; addition ..	
West Virginia—Manufacturers Gas Company; pipe line ..	
W. Va., Huntington—Ohio Valley Bus Company; buses ..	
South—Atlantic Coast Line R. R.; equipment ..	
South—Charleston & Western Carolina Railroad Co.; equipment ..	
South—Louisville & Nashville R. R. Co.; equipment ..	
South—Southern Pacific Company; equipment ..	1,800,000

## Contracts Proposed

Ala., Birmingham—Southern Railway; freight depot ..	
Ark., McGehee—Missouri Pacific Lines; roadbed improvement ..	8175,000
Fla., Miami—Florida East Coast Railway; station ..	1,250,000
Fla., St. Petersburg—Florida Power & Light Corp.; expansion program ..	3,000,000
Ga., Americus—Midland Aircraft Corp.; plant ..	
Ga., Atlanta—Greyhound Bus Lines; garages ..	
Ga., Brunswick—Townsend Band Mill Co.; planing mill ..	
Ga., Carrollton—Hubbard Pants Factory; capacity expansion ..	
Ga., Columbus—Southern Natural Gas Co.; gas line improvement ..	
Ga., Columbus—Teche Lines, Inc.; bus terminal ..	
Ga., Macon—Bibb Manufacturing Co.; mill addition ..	
Ga., St. Marys—St. Marys Kraft Corp.; pulp products plant ..	
Louisiana—General Seafoods Corporation; canning plant ..	
Md., Baltimore—American Telephone & Telegraph Co.; underground cable ..	1,000,000
Md., Baltimore—Bendix Aviation Corp.; additional plant construction ..	18,500,000
Md., Baltimore—Bethlehem Steel Company; extension program ..	
Md., Baltimore—Locke Insulator Corp.; factory unit ..	17,000
Md., Baltimore—Westinghouse Electric & Manufacturing Co.; assembly building ..	50,000
Md., Relay—Calvert Distilling Company; addition ..	
Miss., Greenville—Southern Bell Telephone & Telegraph Co.; building and equipment ..	330,000
Miss., Tupelo—Mid-South Packing Co.; plant ..	30,000
Mo., St. Louis—Curtiss-Wright Corp.; airplane plant expansion ..	8,000,000
Mo., St. Louis—Mario Coil Company; plant addition ..	
N. C., Charlotte—Atlantic Refining Co.; expansion program ..	
N. C., Charlotte—New York Transport Company; terminal ..	2,000,000
N. C., Charlotte—Queen City Coach Co.; bus station ..	325,000
N. C., Greensboro—Russell-Watkins Corp.; hosiery plant ..	
N. C., Hickory—M. & M. Hosiery Company; mill ..	
N. C., Woodlawn—Burlington Mills Corp.; throwing plant ..	
Okla., Oklahoma City—Oklahoma Transportation Co.; bus station ..	100,000
S. C., Anderson—Southern Garments, Inc.; plant ..	
Tennessee—Reynolds Metals Co., Inc.; aluminum plant ..	15,800,000
Tenn., Chattanooga—Lloyd E. Jones Company; steel fabricating plant ..	
Tenn., Covington—Coca-Cola Bottling Co.; plant ..	
Tenn., Knoxville—Spearman Concrete Pipe Co.; machine shop ..	
Tenn., Nashville—Aviation Manufacturing Corp.; plant ..	6,000,000
Tenn., Nashville—Southern Bell Telephone & Telegraph Co.; building ..	60,000
Tenn., Nashville—Werthan Bag Corporation; boiler plant addition ..	
Tenn., Arp—Independent Refining Company; improvement program ..	75,000
Tenn., Borger—Phillips Petroleum Co.; pipe line ..	300,000
Tenn., Brenham—Southwestern Bell Telephone Co.; building ..	80,000
Tenn., Brownsville—Coca-Cola Bottling Works; plant ..	
Tenn., Dallas—Texas Chemurgy Industries, Inc.; plant ..	
Tenn., Galveston—General Seafoods Corporation; shrimp plant and fleet ..	150,000
Tenn., Henderson—Keasler Lumber Co.; planing mill ..	
Tenn., Houston—Arkansas Portland Cement Co.; plant expansion ..	
Tenn., Houston—John Deere Plow Company; plow plant ..	
Tenn., Houston—F. H. Maloney; plant addition ..	50,000
Tenn., Houston—Missouri Bridge & Iron Co.; plant ..	
Tenn., Houston—National Food Bank of Houston; locker plant ..	60,000
Tenn., McAllen—Rio Grande Valley By-Products Corp.; metallic pectinate plant ..	60,000
Tenn., Nocona—Lesh & McCall; gasoline and recycling plant ..	50,000
Tenn., Pharr—Crabb Brothers Company; packing plant ..	
Tenn., Port Arthur—Texas Company; office building ..	300,000
Tenn., San Antonio—George Downs and Antonio Moreno; slaughter house ..	
Tenn., San Antonio—Ne-Hi Bottling Co.; plant ..	
Virginia—Chesapeake & Potomac Telephone Co.; expansion ..	1,000,000
Virginia—Virginia Electric & Power Co.; power project ..	12,000,000
Va., Hopewell—Solvay Process Company; plant ..	
Va., Radford—Hercules Powder Company; plant ..	25,000,000
Va., Roanoke—Chesapeake & Potomac Telephone Co.; improvements ..	32,000
Va., Salem—Salem Full Fashion Hosiery Mill; expansion ..	65,000
Va., Warrenton—Phipps Printing Plant; plant ..	
W. Va., Charleston—Carnegie Illinois Steel Corp.; expansion program ..	
South—Celanese Corp. of America; plant expansions ..	14,000,000
South—Chesapeake & Ohio Railway; equipment ..	
South—Chicago, Rock Island & Pacific Railway; equipment ..	3,090,000



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**Long Distance saves days  
and dollars for many types of  
business. It is fast, adaptable,  
*definite*. Try it and *see!***





# New Ways of Doing Things

## New B Series of Flexible-Coupled Turbine Pumps

The Decatur Pump Company, Decatur, Ill., announces that the 240, 395 and 550 GPH BURKS Super Niagarettes are now available as flexible-coupled units and systems in the company's new B series of Flexible-Coupled Turbine Pumps and Systems. This series is particularly adapted for booster service, boiler feed and condensation return service, as well as for other industrial purposes. Pumps are equipped with standard electric motor or gasoline engine and are available as independent pumps only, for assembly of motor at time of installation. They are the same as the regular direct connected model of the BURKS Super Niagarette series.

## New Size CP Reversible Wrenches

Three new size Reversible Wrenches with bolt capacities of  $\frac{3}{8}$ -inch,  $\frac{1}{2}$ -inch, and  $\frac{3}{4}$ -inch have been added to the line of the Chicago Pneumatic Tool Company, New York City. Known as the CP344-R, CP349-R and CP360-R, the wrenches are



CP 344-R Reversible Wrench of "Power Vane" Type

particularly valuable for applying or removing nuts, being simple and positive in operation. The three types are practically the same in construction while varying somewhat in size and weight. They have no gears or resilient member in the driving unit; are light in weight with short overall length; have tapered nose end, slow-speed rotary motor, and are extremely easy to handle.

## Demonstrate Gar Wood Load-Packer

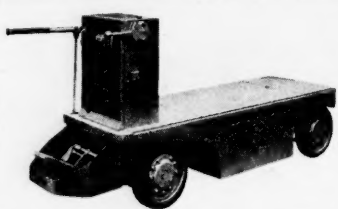
At the annual convention of the League of Virginia Municipalities to be held September 22 at Roanoke, Va., Gar Wood Industries, Inc., Detroit, Mich., will demonstrate the actual operation of the Gar Wood Load-Packer, according to W. H. Hammond, sales manager of the Hoist and Body Division. The demonstration will be in charge of R. P. Fultz, representative of the Baker Equipment Engineering Company, Roanoke, and Ed. Ranck from Gar Wood Industries, Inc. Head-

quarters of Baker-Gar Wood will be at Hotel Roanoke.

The Gar Wood Load-Packer is a modern all-enclosed unit for collecting and hauling rubbish and garbage and is offered exclusively by Gar Wood Industries, Inc. It compresses all types of garbage and rubbish into a compact load and is said to accommodate greater loads in comparison with other types of bodies of similar capacity by reason of compressing the load.

## Light-Weight Load Carrier

As an addition to its line of electric industrial trucks, the Philadelphia Division of The Yale & Towne Manufacturing Company announces Model KM-26, a unit of the load carrier type with a capacity of 3000 pounds. This general utility truck is adaptable to the needs of various types of industry, having been designed to



Model KM-26 Yale & Towne Electric Industrial Truck

carry all kinds of miscellaneous items. It is small and compact and may be loaded by hand, chain hoist, electric hoist, overhead crane or ship's tackle. With a rugged frame of welded steel plate for great strength and minimum truck weight, the unit is particularly valuable for transporting loads over gangplanks, floors, and in elevators of limited capacities. A four wheel steer and small overall dimensions makes it excellent for use in narrow aisles and congested quarters. For the operator's safety, the control platform is protected by a streamlined bumper, while cushioned foot pedals add to the comfort of the operator when the truck is in motion.

## Woven-Moulded Brake Lining in Sheets

An improved woven-moulded brake lining in sheets, produced by the Gatke Corporation, Chicago, Ill., affords facility in meeting widely varying dimensions in brake lining and clutch facings with a



Cutting Sheet Brake Lining

limited stock of material. This improved sheet stock, designated GATKE MAKABLOK, is tightly woven of select long fibre asbestos yarn and soft alloy wire—

saturated with a high heat-resisting frictional compound by a special process — compressed to great density and surface ground to uniform thickness. From a sheet of correct thickness, brake liners and clutch facings may be sawed quickly and accurately to the required size. The material conforms readily to any drum diameter and may be used for either internal or external type brakes. It may also be used for cone type, as well as for disc clutch facings. Furnished in rolled sheets 20 inches wide by 5 feet long, GATKE MAKABLOK comes in 3/16, 1/4, 5/16, 3/8 and 1/2 inch thicknesses.

## Pomona Vertical Turbine Pumps

Higher efficiency and better performance, at lower cost to the user, are afforded by the complete redesign of the Pomona line of 6-inch medium capacity vertical pumps, according to the Pomona Pump Company, Pomona, Cal., manufacturers. This is particularly true of the newly designed impellers and seats. For a desired capacity of 100 g.p.m. against 110 ft. lift in a well and 50 pounds pressure above, a 7½-horsepower motor is



New Pomona 6-Inch Pump for 100 G.P.M.

required, as against a 10-horsepower motor with the old model. The efficiency of this particular size pump for this head capacity has been increased 6½ points, the number of stages has been reduced one-fourth, and the initial cost of the entire unit has been lowered 20 per cent. Other advantages of these pumps which make for low operating costs are: water lubrication, with no stuffing box below ground level; specially designed semi-open impeller which may be adjusted from the surface for wear and for changing capacity; units are non-sandlocking and non-gaslocking. Constructed of high quality bronze, the Pomona semi-open impellers operate in a cone-shaped seat in the pump bowls, while the correct curvature of the impeller vanes assures maximum lifting capacity and prevents overloading of motor regardless of changes in water level. The company makes every type of vertical pump, from the small domestic unit to the large Niagara type delivering 100,000 gallons per minute or more.

## Baltimore Building Operations

(Continued from page 25)

centage of total outlay for both these types of buildings reach that of the period before Annexation, and the average for 40 years for office buildings is 5.11 percent and for commercial buildings 2.52 percent.

Table "A" shows the number, permit value, undervaluation and total cost of building operations in Baltimore per year from 1900 to 1939, inclusive.

This study, a further discussion of which will be continued in a future issue, was made under the direction of Mr. J. A. Clarke, Buildings Engineer of the Bureau of Buildings, a division of the Department of Public Works of Baltimore City, headed by Mr. George Cobb, Chief Engineer.

## Industry Must Meet the Challenge of War

(Continued from page 34)

rope, which is characterized by dormant strands and wires.

Like rope, bearings also vary widely in the amount of maintenance required. Every man who must spend his time lubricating bearings is just one more man who can't do productive work. Wherever an anti-friction bearing with a grease fitting will reduce lubrication time and save valuable man-hours, its use is in line with what is meant by industrial preparedness.

For similar reasons, quality is important in valves and gears. Leaky valves and grinding gears hasten wear and soon require replacement. They add to the non-productive labor required. In the course of a year, their needless waste of man-hours mounts to startling heights.

Many other parts and materials could be named that cost American industry huge amounts of wasted man-hours that will be valued at a premium when industry is called on to do its utmost to support our arms of defense.

When a nation prepares itself for the stark realities of modern warfare, every available bit of manpower will count. We must obtain utmost production from every man-hour. If we aim at any goal short of that ideal, we are gambling with the future of our country.

## Tax Control in East Texas

(Continued from page 33)

the county. Our work has revealed a singular absence of graft or corruption; the mistakes and inefficiency which we have found and weeded out, in nearly every case, have been due to lack of experience, and the county officials have welcomed the expert help which our tax experts have made available to them, to enable them to do a better job. Our ap-

(Continued on page 58)

## More Government Employees

The *Wall Street Journal*, basing its conclusions on figures released by the Bureau of Labor Statistics, says: "Uncle Sam and the states and local govern-

mental units are the only employers among seven major groups who have more persons on their payrolls now than in 1929."

The comparison is given in the following table in various classifications:

Annual Averages (000 omitted)				
	1929	†1940	Dec.	% of Dec.
Manufacturing .....	10,203	9,605	598	5.9
Mining .....	1,064	845	219	20.6
Construction .....	1,806	1,075	731	40.5
Transporta. & pub. util. ....	6,404	6,073	331	5.2
Finance, serv. and misc. ....	4,147	4,131	16	0.4
Govt. (fed., state & local) .....	3,349	4,178	*830	†24.8
Total .....	30,851	28,832	2,019	6.5

\*Increase. †Average, first six months.

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without obligation, for consultation with our engineering staff regarding your special pumping problems.

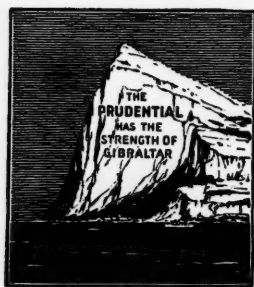
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## *How Far Ahead Can You See?*

A business man trying to plan for the future finds many unknown factors.

But he is likely to forget entirely the greatest uncertainty of all—the length of his own life.

**TO MAKE YOUR PLANS SECURE,  
USE LIFE INSURANCE**



**The Prudential  
Insurance Company of America**  
Home Office, NEWARK, N. J.

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## **FINANCE " " " and " " " INDUSTRY**

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### **Organized Taxpayers**

More and more attention is being paid by taxpayers' organizations to economy in local government. These bodies of citizens brought together for purposes of economy in city and state are organized in a majority of the states and are meeting with encouraging success. Budgets are being gone over and communities are being aroused to the necessity for saving at every possible point. In some communities notable success has been achieved and cash surpluses are replacing deficits, strange as it may seem in this day of political mismanagement.

Governor Harold E. Stassen of Minnesota, is a notable example of what can be accomplished by leaders bent upon putting state affairs upon a cash and surplus basis instead of trying to exact everything possible in the way of taxes while keeping up expenditures for political purposes.

### **Excess Profits Tax**

The excess profits tax very probably will be made into law by Congress if it has not already been passed when this is printed.

There is no evidence that business as a whole objects to necessary taxation, but will agree in being opposed to tremendous profits being made out of the country's defense or out of war. In scrutinizing, however, the financial situation of government and taking into account income and expenditures, there is serious doubt not as to the necessity for taxation if the Federal debt is to be paid, but about a lot of the expenditures that seem to be unwise and unnecessary. Men object to being taxed for a lot of foolishness that has gone on, and especially as they see no evidence of an extravagant policy being stopped. That is the pity of it.

### **Life Insurance Gains**

The Association of Life Insurance Presidents reports an increase of 19.5 per cent in July of this year over July of last year. Group insurance made the most notable advance, the total in this classification being \$43,520,000 against \$23,862,000, or an increase of 82.4 per cent.

New business of all classes in the first seven months of 1940 showed a decrease of 1.2 per cent from the figures of 1939.

### **Profits**

Departments of the government express the opinion that the profits of industry probably will approach the figures of 1929. Statements released for the quarter ending June 30 show a considerable recovery in industrial production over the three months preceding, but the current quarter ending September 30 may not show quite as good results.

Due account is taken of the fact that this advance to a considerable extent is due to war and defense orders which continue in volume. An early peace no doubt would have a similar deflationary effect.

As the huge sums that are to be spent for getting America ready find their way into the channels of trade, it is obvious, unless the war stops much sooner than is now expected, advances in production in lines already feeling the effect will be sustained and increased and will enter into other industrial channels not so far directly benefited.

*(Continued on page 46)*

**MANUFACTURERS RECORD FOR**





Stealing away for a round of golf may or may not bring you a piece of business.

\$\$\$ But your time is well spent if you become more impressed with the application of *follow-through* in your advertising and selling.

\$\$\$ Follow-through cuts golf scores down. It also pushes sales curves up.

\$\$\$ If you advertise machinery or bank service or insurance or raw materials to high executives, in publications they read at home, you cash in by *following through*. This demands *merchandising* your home-read messages at low cost in The Wall Street Journal, which executives read in their offices—your *point of sale*.

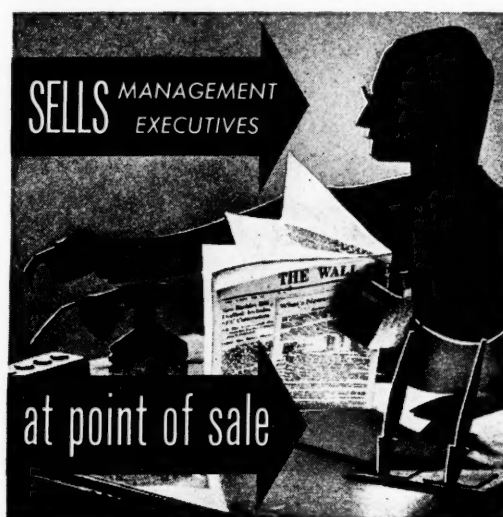
\$\$\$ 86 per cent of The Wall Street Journal's circulation is read by executives at their desks.

\$\$\$ It gives you, per advertising dollar,

more readers who are active management-executives of industrial corporations with assets of over \$1,000,000 than any other publication—*magazine or newspaper*.

\$\$\$ So be sure to follow through with The Wall Street Journal—and your thanks to golf for a highly profitable idea.

## WALL STREET JOURNAL







## TIME LIGHTLY TOUCHES THE FINE QUALITY OF LAYNE WELLS AND PUMPS

When you buy a Layne Well Water System, you can be assured that it will give you long years of excellent service. In addition to using the very best quality in materials, Layne also provides special types of metal for submerged parts. This infinite attention to details is legion through the Layne organization and has served to build a world-wide reputation for the dependability of Layne wells and Pumps.

At this time there are many plans being drawn for expansion and much actual building is already under way. Would it not be wise to give extra attention to your water problems by direct comparison with any equipment on the market, you will find exclusive and outstanding features in Layne wells and pumps. Year by year and dollar by dollar, Layne offers you the best value.

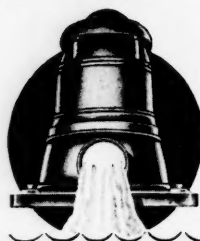
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DALLAS, TEXAS  
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LAYNE-BOWLER NEW ENGLAND COMPANY,  
BOSTON, MASSACHUSETTS  
INTERNATIONAL WATER SUPPLY, LTD.,  
LONDON, ONTARIO, CANADA

## Finance and Industry

(Continued from page 44)

### Investment Market

Uncertainty about the situation abroad has not been conducive to an active investment market in new securities, even if other conditions at home were regarded as entirely favorable.

Encouragement has been taken from the fact that underwriters have ventured in the market with a few new offerings of evident value. The demand, however, was not sufficient to cause the belief that stored up capital was ready to invest actively.

As this is written the situation is still uncertain as to the completeness of the defense England may be able to put up against Germany's assault. It is also to be borne in mind we are in the midst of a Presidential year of unusual import.

### Railroad Orders

The Association of American Railroads announced in August that on the first of that month 19,765 new freight cars were on order. This is twice as many as were on order the same time a year ago. In addition, 168 new locomotives—115 steam and 53 electric and Diesel—were on order.

In the first seven months of this year the carriers put in service 40,416 new freight cars, compared with only 10,302 in the same period of the year before.

In the recent movement of troops for summer maneuvers, the railroads have given an illustration of how they are prepared to handle increased demands upon their traffic facilities. They have evidently been taking conditions of increasing passenger and freight movement, as one official termed it, "in their stride."

The Pullman-Standard Manufacturing Co. at Bessemer, Alabama, has announced that it is at work on a \$2,500,000 order from the Illinois Central for 1,000 box cars, and also a \$250,000 order for 100 box cars from the Louisville and Nashville Railroad. Among other miscellaneous orders they have one for 200 hopper cars from the Gulf, Mobile & Ohio, 75 cement cars for the Southern Railway, and 25 of a similar type for the Louisville & Nashville Railroad.

### As Business Waits

As this issue of the MANUFACTURERS RECORD goes to press, two items in the legislative mill—excess profits tax and the proposal to conscript industry—are claiming more than ordinary attention on the part of the business world.

The indications are that an excess profits measure in some form will pass. The bill as first introduced was complicated and unwieldy, and already various amendments to clarify it have been offered.

There seems to be more inclination, than has been usual in some of the hurried legislation adopted in the past, to consider what will prove least harmful to private enterprise upon which so much depends in the present crisis.

The bill to place dictatorial powers in the hands of the President to take over plants if deemed necessary in the interest of defense is another matter. Confusion in the debate so far is such that it is impossible to judge what form the legislation may take, if any. At the moment it appears that the original bill will be greatly modified before it will stand a chance of passage.

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# INDUSTRIAL NEWS

## Sale of Soapstone Deposits

Application may be made to D. N. Davidson, Orange, Va., regarding a dissolution auction sale of the Rapidan Soapstone Corporation, owning valuable soapstone deposits in Orange County, Virginia, the sale to be held at 11 A. M., Wednesday, October 2, 1940. The property embraces about 275 acres, core-drilled by Richard K. Meade and Company, industrial engineers of Baltimore, Md. It is estimated to contain 78,000,000 cubic feet of superior soapstone, as well as a considerable amount of talc.

## Westinghouse Air Brake Promotions

The Westinghouse Air Brake Company, Pittsburgh, Pa., announces three promotions in its shop management personnel as follows: H. L. Nicholson, who has been with the company for 37 years and has served as Works Manager since 1919, is promoted to Director of Factory Operations; W. C. Landis, after 25 years' service with the company and Assistant Works Manager since 1930, has been made Works Manager, succeeding Mr. Nicholson, and A. B. Fox, who entered the employ of the company 35 years ago and has served as Superintendent of the Traction Brake Division since 1920, has been appointed Assistant Works Manager, succeeding Mr. Landis.

## United States Steel Promotions

Charles R. Miller, Jr., has been appointed Director of Purchases, United States Steel Corporation of Delaware, with headquarters at its Pittsburgh, Pennsylvania, offices, taking over the duties with respect to purchases of Charles H. Rhodes, Vice President, who has been transferred to Chicago. Mr. Miller, as purchasing agent of Carnegie-Illinois Steel Corporation, Pittsburgh District, is succeeded by R. L. Van Cleave, his assistant for many years.

## Laseter Joins Roebeling Company

Announcing the creation of a new Export Division to be located at 19 Rector Street, New York City, John A. Roebeling's Sons Company, Trenton, N. J., manufacturer of wire rope, electrical wires and cables, strip steel and other wire specialties, has appointed William P. Laseter Manager. Mr. Laseter is a native of Georgia and was graduated from Georgia Military College shortly before the entry of the United States into the World War. Receiving his commission at Fort McPherson, he was sent overseas immediately and saw active service with the American Expeditionary Forces. Since 1919, he has been identified with Latin-American trade and has spent much of his time in Cuba and Mexico.

He comes to Roebeling from the Oil Well Supply Company where he served as Assistant Manager of the Export Division, as well as President of Cia. Consolidada "Oilwell," S. A., Mexican subsidiary.

## Sells Turbine Pump Business

The Roots-Connersville Blower Corporation, Connersville, Ind., announces the sale, effective September 1, of its Turbine Pump business, consisting of water systems, condensate units and turbine pumps for general industrial applications, to the Sterling Pump Corporation of Hamilton, Ohio. The purchasing corporation will manufacture and sell this line of pumps under its own name.

## Rooney Becomes Comptroller of United States Steel

The appointment of George W. Rooney as comptroller of United States Steel Company, effective October 1, is announced by Irving S. Olds, chairman of the board. Mr. Rooney, who has been associated with United States Steel subsidiaries since 1930, succeeds Adolph W. Vogt who died last November. Born in 1894, he was educated in the public schools of Pittsburgh and attended the University of Pennsylvania. He has wide experience in the entire field of accounting, extending over a period of 25 years, and has served as comptroller of the National Tube Company since his appointment in 1938, coming to United States Steel from that post. During the last World War he served 14 months in France as a sergeant of Company A 315th machine gun battalion, 80th Division.



## REX-WELD Flexible Metal Hose

For conveying oils, gas, water, air, searching fluids; for use at temperatures to 1000° F. (Steel), pressures to 14,500 p.s.i. (Bronze and Steel); for conditions involving prolonged flexing, vibration, extremes of

contraction and expansion; for industrial maintenance and production equipment; for permanent and temporary lines; for conveying fluids to moving machine parts where flexible connections are required.

Rex-Weld Flexible Metal Hose is fabricated from strip metal by special process, providing uniform wall thickness, flexibility, greater strength. Available in true bronze (98% copper, 2% tin); cold rolled steel; various alloys. 50 ft. continuous lengths. Sizes 1/8" to 4" I.D. Re-attachable couplings. Write for data.

Immediate delivery available from stocks in the South.

**CHICAGO METAL HOSE CORPORATION**  
MAYWOOD, ILLINOIS

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FIFTH  
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REGISTERED TRADEMARK

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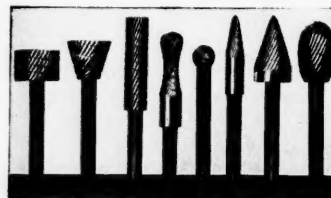
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Structural Steel for all Industrial Structures,  
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## EYES ON VIRGINIA

In the steadily progressing industrial development of Virginia, First and Merchants plays a leading part because of the unusually broad experience of its official personnel in various lines of manufacturing. Richmond alone has more than 300 widely diversified industries—many of them customers of the bank.

Ever since its founding 75 years ago, this bank has been a favorite for manufacturers. If you wish to know more about industrial opportunities in Virginia or about our services, communicate with us, and your inquiry will be given immediate attention.

1865—SEVENTY-FIFTH ANNIVERSARY—1940

### **FIRST AND MERCHANTS National Bank of Richmond**

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H. Hiter Harris, President

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Natural gas has created the possibility of effortless comfort by the facility, and economy with which it fits into the home.

### **SOUTHERN NATURAL GAS COMPANY**

**Watts Building**

**Birmingham, Ala.**

## TRADE LITERATURE

### MATERIAL-HANDLING EQUIPMENT—

Booklet—"Acme Skid-Load Process," illustrating and describing the Acme Skid-Load Process and showing how shipping and handling costs, with a saving of time and warehouse space, may be effected.  
Acme Steel Company, 2840 Archer Avenue, Chicago, Ill.

### PAINTING CREOSOTED WOOD—

Leaflet—"The Painting of Creosoted Wood" describes seasoning after treatment and gives directions for painting creosoted poles and posts with aluminum paint.

The Wood Preserving Corporation, Koppers Company Subsidiary, Pittsburgh, Pa.

### KOPPERS D-H-S BRONZE—

Leaflet—illustrated, describing engineering applications of Koppers D-H-S bronze; recommended uses are listed and table giving minimum physical properties for D-H-S bronze Nos. 1, 2, 3 and 4.

Koppers Company, Bartlett Hayward Division, Baltimore, Md.

### WATER SOFTENERS—

Bulletin No. 234—"Permutit Hot Process Water Softeners," 32 pages, illustrated, presenting a comprehensive treatise on hot lime soda softening and describing the five types of deaerating and non-deaerating heaters, explaining the principle and function of each unit part; devotes space to filters, vertical and horizontal, and the electro-chemical feed, with a brief section on the chemistry of water softening and corrective treatments.

The Permutit Company, New York City.

### METAL BONDED DIAMOND WHEELS—

Booklet, Form 388—"Norton Metal Bonded Diamond Wheels," illustrated, the first booklet of the company to thoroughly discuss the uses and application of the Norton metal bonded diamond wheel.

Norton Company, Worcester, Mass.

### PERFORATED METALS—

Catalogue No. 33—on Diamond Perforated Metals for every industrial use.

Diamond Manufacturing Company, Wyoming, Pa.

### ARCHITECTURAL GRILLES—

Catalog No. 32—attractively prepared and illustrated, devoted to Diamond Grille Specifications for architects and engineers; section one treats of architectural grilles of heavy perforated metal, and section two of air-conditioning registers and grilles; the publication marks the 25th anniversary of the—

Diamond Manufacturing Company, Wyoming, Pa., manufacturers of sizing screens and architectural grilles of perforated metals, cast grilles and registers.

### FLEXIBLE COUPLINGS—

Data Book—20 pages, essentially a hand book planned for design and maintenance engineers as well as purchasing executives, presenting complete tabulated data on horsepower and torque ratings as well as dimensional specifications on the complete Ajax line of forged steel and cast iron couplings, including conventional and shear pin types.

Ajax Flexible Coupling Company, Westfield, N. Y.

### RUBBER PRODUCTS—

Catalog—"Hewitt Rubber Products for the Oil Marketing Industry," illustrated, embracing one section of a general catalog, two other sections to be published soon—one on products for the oil producing industry, and one covering miscellaneous products for general industry.

Hewitt Rubber Corporation, Buffalo, N. Y.

"Lessons in Arc Welding"—Under the foregoing caption, The Lincoln Electric Company, Cleveland, Ohio, has published a book of lessons for arc welders designed not only for beginners but for experienced welders desiring the comprehensive practical information contained in the book. There is a series of 51 lessons, based upon experiences of Arthur Madson, instructor of the Lincoln Arc Welding School, presenting in a concise manner fundamental facts of welding, a knowledge of which will enable the welder to successfully and economically utilize the welding process. The publication contains 144 pages 6 by 9 inches; more than 100 illustrations, including photos and drawings, and is bound in a semi-flexible simulated leather cover, gold embossed. The price is 50 cents per copy, postage prepaid anywhere in the United States, and 75 cents per copy outside of the United States.

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Agents in all principal cities.

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the Country's LARGEST  
—HOT DIP JOB GALVANIZER—

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Worm gears any practical size. Backs curved or straight. Fast Delivery—Fair Prices.

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FOR BRICK, TILE AND BLOCK,  
FROM SMALLEST TO LARGEST CAPACITY.

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**Pumps—Deep-Well Plunger and Turbine**

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**WATER PRESSURE SYSTEMS**

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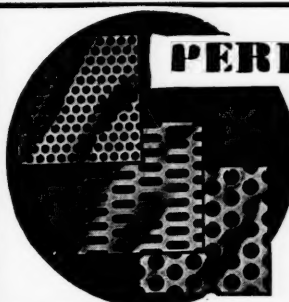
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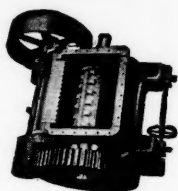
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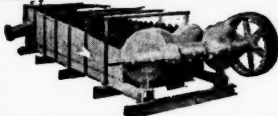
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Single and double roll and jaw crushers, hammer mills, super dry pans—steel log washers and scrubbers, sand drags, revolving and vibrating screens, elevators, conveyors, dryers, jigs, hoists.

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Complete portable, semi-portable and stationary crushing, screening and washing plants for different capacities of any materials.



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SIXTY YEARS' experience in Metal Perforating is your assurance of a satisfactory job.

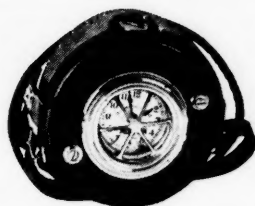
Made to your specifications and shipped promptly.

*Metal Sample Plate on Request.*

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Screens and grilles in all commercially rolled metals, all standard and special designs.

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**QUALITY • EFFICIENCY • SERVICE**

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For every purpose, Industrial and Ornamental

Steel, Stainless Steel, Monel Metal, Brass, Copper, Bronze, Aluminum, Zinc, Lead, Tin Plate and all other metals or materials perforated as required, and for all kinds of screens. Send for new Catalog.

**CHARLES MUNDT & SONS**

400 Johnston Ave.,

JERSEY CITY N. J.



## Defense Program Awards in the South

(Continued from page 37)

"	"	V. P. Loftis, Charlotte, N. C. ....	Hospital ward — Naval Hospital Charleston .....	44,835.00
"	"	Charles W. Angle, Inc., Greensboro, N. C. ....	Barracks — Storage and aviation facilities, Marine barracks, Parris Island, S. C. ....	2,394,750.00
"	"	United Engineers & Constructors, Inc., Philadelphia, Pa. ....	Improvement of power plants at the Navy Yards, Charleston, S. C. ...	400,000.00
"	"	United Engineers & Constructors, Inc., Philadelphia, Pa. ....	Improvement of power plants at Marine barracks, Parris Island, S. C. ....	375,000.00
Estimated cost of 5 Naval vessels contracted for with Charleston Navy Yard between June 13—July 12....			.....	46,449,000.00
Construction loan for 400 dwelling units, Charleston—near Navy Yard .....			.....	1,416,000.00
Medical Dept.		Cameron Bedding & Mfg. Co., Cameron .....	Conversion of Mattresses .....	18,955.00
		Construction, utilities, roads .....	Charleston Navy Yard .....	600,000.00

### TENNESSEE

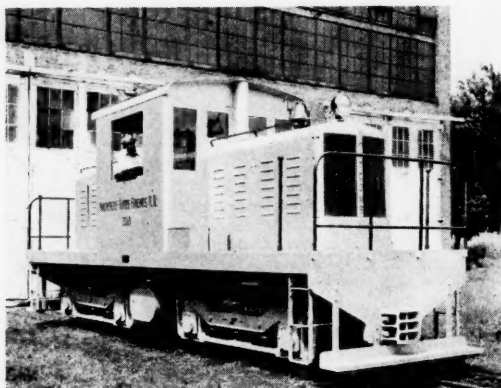
Qtmtr. Corps		Carless Well Supply Co., Memphis .....	Test Wells — Southeast Air Depot, Alabama .....	\$11,500.00
"	"	Southern Athletic Co., Knoxville .....	Barrack bags .....	71,060.00
"	"	General Shoe Corp., Nashville .....	Shoes, service .....	146,100.00
"	"	Foster & Creighton Co., Inc., Nashville .....	Depot Supply Bldg. and Engine Repair Shop for Southeast Air Depot, Tampa, Florida .....	1,433,400.00
Ordnance WPA	"	Nat'l Rose Spring & Mattress Co., Memphis .....	Mattresses .....	16,350.00
	"	Wheland Company, Chattanooga .....	Guns .....	912,800.00
	"	Construct office building, Municipal Airport, Memphis .....	.....	30,312.00
	"	Approximate allocation from \$25,000,000 TVA National Defense appropriation for: Dam on Holston River near Jefferson City. (Remaining allocation: For 2 generating units at Wilson Dam.)		
		Alabama .....	.....	\$3,000,000
		Distribution lines, etc. ....	.....	2,000,000

### TEXAS

Qtmtr. Corps		J. G. Bartholomew, Dallas .....	Sewage treatment plant, Ft. Benning, Georgia .....	30,750.00
"	"	Robert E. McKee—El Paso .....	Constr. at Albrook Field, Canal Zone .....	2,271,500.00

(Continued on page 54)

# WHITCOMB RULE IN DESIGN



- ✓ Rugged Construction
- ✓ Uninterrupted Service
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- ✓ Ease of Operation

You want a rugged, reliable locomotive that is capable of handling your toughest assignments—ready for service 24 hours a day—year in, year out. What's more, it must operate with the greatest economy and efficiency—insuring low cost per operating hour. The control system must be simplified to the nth degree—no special skill required.

Every Whitcomb locomotive is designed to give you these important advantages in your industrial service. Let us give you more details.



DIESEL — GASOLINE — ELECTRIC

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*Subsidiary of* ROCHELLE, ILL.  
THE BALDWIN LOCOMOTIVE WORKS

# Overhead Electric Traveling Cranes

## CAPACITIES 1 TO 450 TONS

• 33 Shepards speed assembly for this machine tool manufacturer. Here again Shepard Niles planned load-handling is paying dividends. Every process that needs a lift is served by a Shepard Niles crane or hoist—production moves swiftly and surely, with never a hitch or a halt. All along the production line—wherever you need a lift—there's a Shepard Niles crane or hoist of the exact type and capacity for the job.



• Welded Box Girder Crane equipped with Shepard Niles 5-Speed Push Button Control for hoist, trolley and bridge motors.

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**SHEPARD NILES**  
CRANE & HOIST CORP.



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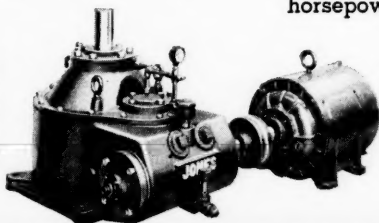
**WELDED  
GIRDER  
TYPE**  
•  
CAPACITIES  
1 TO 15 TONS  
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GIRDER TYPE**  
1 TO 450 TONS

362 SCHUYLER AVENUE . . . MONTAUR FALLS, N. Y.

## For driving agitators, mixers and similar equipment— JONES WORM-HELICAL SPEED REDUCERS



• This Jones Worm-Helical Speed Reducer on a lacquer agitator is typical of the wide range of services for which these drives can be used such as ore roasters, pulp tank mixers, furnaces, bending rolls and similar applications.



**H**ERE is a line of machines that fills a long felt need for double reduction units of the fully enclosed type to be used for agitators, mixers, etc. requiring a vertical shaft drive.

Many of these Jones units have established excellent performance records in a wide variety of service. As a result of that experience a complete standard line has been developed covering 15 standard ratios ranging from 40 to 1 to 250 to 1 for all common motor speeds and a wide range of horsepower ratings.

The new Jones Bulletin No. 75 covers complete details on these new Worm-Helical Speed Reducers, with rating tables, dimension diagrams, torque charts and other application information. We shall be pleased to send you a copy.



**W. A. JONES FOUNDRY & MACHINE CO.**

4425 Roosevelt Road, Chicago, Illinois

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HERRINGBONE—WORM—SPUR—GEAR SPEED REDUCERS • PULLEYS  
CUT AND MOLDED TOOTH GEARS • V-BELT SHEAVES • ANTI-FRICTION  
PILLOW BLOCKS • FRICTION CLUTCHES • TRANSMISSION APPLIANCES

## Defense Program Awards in the South

(Continued from page 52)

Ordnance	H. H. Moeller—San Antonio .....	Repair bldg.—Duncan Field .....	142,258.00
	E. L. Dalton—Dallas .....	Gas distribution system, Kelly Field .....	15,504.50
	Crawford-Austin Mfg. Co.—Waco .....	Mattresses & folding canvas cots ..	412,437.20
	Taylor Bedding Mfg. Co.—Taylor .....	Mattresses .....	230,125.00
	H. H. Moeller—San Antonio .....	Superstructure of equipment—Repair Bldg.—Duncan Field .....	142,258.00
	Edw. W. Oeffinger—San Antonio .....	Engine test bldg.—Duncan Field ..	259,200.00
	Taylor Bedding Mfg. Co., Taylor .....	Mattresses .....	183,150.00
	Guiberson Diesel Engine Co.—Dallas .....	Diesel Engines and parts .....	2,915,255.86
	Construction, utilities, roads .....	(Army) Duncan Field (near San Antonio) .....	250,000.00
	Construction, utilities, roads .....	(Army) Brooks Field (near San Antonio) .....	75,000.00
Yards & Docks	Construction, utilities, roads .....	(Army) Fort Sam Houston (near San Antonio) .....	100,000.00
	Construction, utilities, roads .....	(Army) San Antonio Gen. Depot .....	50,000.00
	Construction, utilities, roads .....	(Army) Kelly Field .....	200,000.00
	Construction, utilities, roads .....	(Army) Randolph Field .....	50,000.00
	Construction, utilities, roads .....	(Army) Normyle Qtmr. Depot .....	50,000.00
	Construction, utilities, roads .....	(Army) Fort Crockett .....	50,000.00
	Construction loan for 250 dwelling units near Corpus Christi .....	.....	989,000.00
	Brown & Root; Columbia Construction Co.; W. S. Bellows .....	Naval Air Station, Corpus Christi ..	23,318,000.00
	Construct and improve buildings, facilities and grounds .....	(Army) at Ft. Clark .....	84,051.00
	.....	.....	.....

## VIRGINIA

Qtmr. Corps	Aqua System, Inc.—N. Y. C. ....	Addition to AC gasoline, Fueling System, Langley Field, Va. ....	125,594.00
"	Virginia Woolen Co.—Winchester .....	Uniform cloth .....	232,000.00
"	John K. Ruff Co.—Baltimore .....	Hospital alterations, Ft. Monroe .....	73,880.00
"	Amer. Hardware Co., Inc.—Petersburg .....	Trunk lockers .....	165,375.00
"	Rogers Awning Mfg. Co., Portsmouth .....	Covers, mattress .....	20,317.70
Corps of Engrs.	Virginia Bridge Co., Roanoke .....	Parts for loading bridges .....	20,056.00
"	Virginia Bridge Co., Roanoke .....	Portable highway bridges .....	156,921.64
Chemical Warfare	Virginia Rubatex Corp.—Bedford .....	Faceblanks, valves and hose .....	131,995.00
Ordnance	The Tredegar Co.—Richmond .....	Projectiles .....	99,855.50
Yards & Docks	John McShain, Inc.—Phila., Pa. ....	Aviation and Marine Corps facilities, Quantico .....	1,460,250.00

(Continued on page 60)

# Blaw-Knox GRATING

**STANDS FOR**

1st Electroforged one-piece construction.

2nd Easily maintained paint reaches entire surface.

3rd Self cleaning—no sharp corners to clog.

4th Non slip because of the twisted bar.

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Typical repairs and patches made with Flexco HD Rip Plates.

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4690 Lexington St., Chicago, Ill.

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MADE IN U.S.A.

**HD BELT FASTENERS**

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**LYONORE METAL**  
gives you

## GREATER ECONOMY!



It's money in your pocket to use this corrosion-resistant alloy! Made in one of the largest mills in the world according to an exclusive formula which combines chromium, nickel, copper and iron in such proportions that the alloy lasts years longer than ordinary sheet metals. To get the most for your sheet metal dollar, use genuine Lyonore Metal! Send for details today.

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CHROMIUM - NICKEL - COPPER - IRON ALLOY

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**Chemical  
Stoneware:**

ALL TYPES  
CHEMICAL BRICK  
AND SHAPES.

SPIRAL RINGS,  
DIAPHRAGM &  
RASCHIG RINGS.



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Tile:**

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QUARRY FLOOR  
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Heavily galvanized after weaving, resists corrosion. Hercules H-I posts, strongest, heaviest, unbreakable arms, form backbone of good fence.

Gates, with fool-proof latch bars, ball and socket hinges, built to withstand severe use and abuse. MFRS. and ERECTORS. Agents everywhere. Catalogue. 1620-40 West 31st Street, Chicago, U. S. A.



Pipe and Copper Shop, Navy Yard, Philadelphia, Pa. 20,000 sq. ft. White and 11,300 sq. ft. Actinic, Corrugated Wire Glass—side-wall and monitor construction.

## SPECIFY ORIGINAL SOLID CORRUGATED WIRE GLASS

For side-wall construction with non-corrosive accessories of Aluminum or Copper. We can furnish fixed panels, center or top pivoted vents three lights wide or continuous top hung ventilating units.

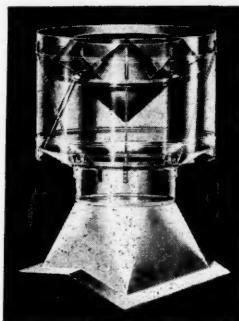
Also used with excellent results for skylights, marquees, canopies or wherever daylight is needed.

Our Engineering Service Department will be glad to aid you on your daylighting problems. Write or wire.

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## Make Wind Do the Work

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Here is the simplest, most effective gravity roof ventilator made, best adapted for all general requirements. The extra wide wind band creates a powerful suction, and interior construction allows free flow of air continuously upward. Having no moving parts, there are no service problems. Burt makes a type and size for every need.

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EXHAUST HEADS

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# GOOD SERVICE is Good Business

*by Westinghouse*



• *Probably it never occurred to you, but the life of a Westinghouse Service Engineer is a very exciting career. This morning he may be doing a simple repair job, and this afternoon he may be aboard a plane speeding to the rescue of a power company miles away whose electrical equipment has been paralyzed by some disaster.*

• *For instance, we recall the hurricane that swept the Atlantic seaboard in 1938. A record tide played havoc with the generating equipment of one of New York City's great power plants. At midnight our Service Department received the emergency call. By morning, the entire New York field force, reinforced by service men from our Newark, Pittsburgh, Buffalo, Utica and Philadelphia Service Shops were on the job.*

• *They found machinery flooded with salt water and drenched in a sludge of oil. 35 large pumps and auxiliary motors and their electrical controls were affected. Yet by the middle of the fourth day, one of the generating units was back in service. A crew of 135 men working in three eight hour shifts soon had the entire station back in normal operation.*

• *Only a year before our service men braved even fire to help a Cincinnati customer continue operations. Because our men stayed on the job in a building choked with smoke and intense heat from an adjoining fire, the company was able to maintain its regular production schedule.*

• *Ingenuity is also a prime requisite of these service men. For instance, our New England men were given the problem of drying and smoothing out water soaked currency, bonds and other valuable papers soaked by flood. They did it promptly and efficiently simply by using Westinghouse household ironers to press the paper straight and dry.*

• *These are only a few examples of the score of unusual tasks a Service Department must perform. Actually, this department, in our case, is an industry within itself. We must manufacture millions of dollars worth of service equipment each year. This includes special equipment as well as renewal parts for apparatus which is no longer in regular production.*

• *To meet the unending demands for electrical service we maintain thirty-six service plants strategically located throughout the country. More than 3,000 men are normally employed. No piece of electrical apparatus in America is more than a few hours by rail, boat or plane from these plants, equipment and men.*

• *Naturally, we are proud of the record of this department. And we, as many others, consider it one of the most important arms of our business. Good Service is always Good Business.*

## A New Fabric

The Goodyear Tire and Rubber Company has announced a new fabric of many uses which is water-proofed with a coating of a synthetic substitute for rubber, and all the advantages of the natural product are claimed for it with none of its disadvantages. The name given it is Pliosheen. It is made of silk or rayon, odorless, tasteless, and is said to resist flame, besides containing no rubber or oil. It is expected that it will be made in a complete range of colors and to resist action against sun and be proof against cracking or peeling.

Its many advantages are said to include printing without technical difficulties, and also an unlimited number of patterns designed to harmonize with all surroundings will be possible.

Some of the uses are for raincoats, shower curtains, drapes, umbrellas, hospital sheeting, oxygen tents, clothing, etc.

This is another advance of science in the search for rubber substitutes, and the new product is said to be made from a combination of materials extracted from limestone, coal and salt.

## Precision Work

The machine tool industry is operating night and day helping to get America fully armed and prepared. Shops of New England and the mid-West, which turn out this fundamental equipment necessary for machinery and armament manufacture, are beehives of activity.

The precision with which machine tools are manufactured means the excellence or the reverse of the products on which they are used. Laborious handwork with parts fitted to microscopic exactness requires a high degree of training in the employment of skilled mechanics who have spent a lifetime at the job. Without such workmanship the guns and the shells which other manufacturers turn out, and upon which depends success or failure in after use, would be defective.

This is one industry in which the demand for skilled labor exceeds the supply. The present emergency may lead to a wider adoption of vocational training in the schools of the land.

## To Make Medium Sized Tanks

The Chrysler Corporation received last month a \$54,500,000 contract to build a government-owned factory and to manufacture medium tanks on a mass production basis.

Construction of the factory will cost \$20,000,000, and the first production contract calls for tanks to the amount of \$34,500,000 at a fixed unit price following army specifications.

The plant will be constructed in the Detroit area and will have approximately 800,000 square feet of space. It will be finished and equipped for production within 13 months, and is expected to employ between 4,000 and 5,000 workers.

## Southern Contracts Reach Peak Level For August

(Continued from page 39)

additional buildings and another award amounting to \$107,770 was made for an addition to Bancroft Hall, the academy's big drill hall. A supply building and repair shop project at the Southeast Air Base, Mobile, will be built under a \$1,433,000 army contract. New concrete runways are Langley Field, Va., will cost \$173,648.

Florida, where both army and navy authorities are carrying out some of their greatest projects, will get a number of new structures under newly awarded contracts. Hangars at MacDill Field, Tampa, will cost \$1,065,500. A \$137,700 contract was let for mess hall, barracks, recreation building and other work at the Orlando army base, and another for \$155,113 was for officers' quarters, base administration building and guard house.

Contracts for work at Texas air fields and bases included one in the amount of \$125,000 for temporary buildings at Fort Crockett; a \$259,200 award for an engine test building and spray pool at Duncan Field, and barracks and recreation buildings at Brooks Field to cost \$140,600. Bids were also opened for temporary army construction at Fort George G. Meade, Md., the low bid being \$235,963.

## S. S. Exchequer Launched at Pascagoula, Miss.

Last month the S. S. *Exchequer*, the second of four sister ships, was launched by the Ingalls Shipbuilding Corporation at Pascagoula, Mississippi. All four ships are of the C-3 classification of the Maritime Commission. A member of the American Export Lines fleet, she is the eighth ship to be launched by them in the past ten months. The S. S. *Exchequer*, the first of the series was launched at Pascagoula on June 8.

Each of the four ships will have a displacement of slightly over 17,000 tons, and a length of approximately 495 feet, making them among the largest ever constructed at a Gulf yard. They are designed to attain a maximum speed of sixteen and a half knots.

These vessels, built under the direction of the U. S. Maritime Commission, are the largest all-welded cargo ships ever to have been launched in this country. It was necessary for the Louisville and Nashville Railroad to build a special spur-line railroad to transport fabricated steel to the selected site near the mouth of the Pascagoula River. Use of this railroad reduced the capitalization of the Pascagoula plant to half of what it would

(Continued on page 63)

**A FREE OFFER  
TO CLUBS, SCHOOLS, CHAMBERS  
OF COMMERCE AND OTHER  
CIVIC ORGANIZATIONS**

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**A SOUND & COLOR MOTION  
PICTURE PRODUCED BY  
"THE ARCADIAN GROWER"**

**EVERY SOUTHERNER** will be proud to see "THE NEW SOUTH". Here in the short space of 45 minutes, in the sound and color of a modern motion picture, is portrayed much of the agricultural and industrial progress of the South. The film tells the story of Nitrogen in Southern agriculture and how a great Southern industry has been built to supply this Nitrogen.

"THE NEW SOUTH" is a 16 mm. motion picture produced in natural color with vivid commentary and incidental music. It is available for free loan to clubs, schools, chambers of commerce and other civic organizations — with or without operator and equipment.

If you are a representative of one of the above-mentioned groups and wish to show "THE NEW SOUTH" to your organization in your town, communicate with the nearest office below to arrange for a free showing.

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# What to do about the **SNOOPER!**

**SNOOP** (*snōōp*), *v.i.* [*D. snōēpen*]

To look or pry about in a sneaking or meddlesome manner; also to search pryingly for information, etc.—**SNOOPER** (*er*), *n.* one who snoops.

—Webster's Dictionary

**N**OW is the time to keep prying eyes away from your plant—to be sure that burglars, trespassers or others who have no business on the premises are kept out . . . to prevent the work of firebugs. It's too big a job for your watchman to do alone. But you can have a record of every man who enters your plant—and every piece of material that goes out when the watchman has the help of U-S-S Cyclone Fence.

Cyclone Fence provides easy entrance for people you want, at conveniently located gates. And it politely, but forcefully refuses admittance to people you don't want in your plant.

Get the facts now about protection of sturdy, long-lasting Cyclone Fence. We'll gladly make a recommendation and give a free estimate with no obligation to you. Remember, Cyclone leads the field in sales, so our prices must be right.

CYCLONE FENCE CO., DEPT. 890  
Waukegan, Ill.

Please mail me, without obligation, copy of "Your Fence—How to Choose It—How to Use It." I am interested in fencing: ☐ Industrial; ☐ Playground; ☐ Residence; ☐ Estate; ☐ School. Approximately . . . feet.

Name . . . . .

Address . . . . .

City . . . . .

State . . . . .

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Standard Fence Company, Oakland, Calif., Pacific Coast Division

United States Steel Export Company, New York

# UNITED STATES STEEL

## Largest Diesel-Electric Passenger Locomotive Order Placed by Atlantic Coast Line

(Continued from page 23)

and the Atlanta, Birmingham and Coast Railroads in inaugurating next season daily through streamlined coach trains between Chicago and Miami on considerably reduced schedules.

Few business institutions possess as intimate knowledge of the developments within their spheres of service as do the railroads, and the action of the Atlantic Coast Line Railroad, coming as it does after more than one hundred years of service in the territory it traverses, reflects a confidence in the rapidly expanding industrial and recreational activities of the states it serves.

## Tax Control in East Texas

(Continued from page 43)

proach and our work with the county officials and the taxpayers' groups invariably is cooperative, not critical. We believe that the friendship and cooperation of the county officials has made our program successful, and will continue to contribute to its success, as we extend our work to the school districts, the municipalities, and other taxing units within our region, which we plan to do in the immediate future."

The Chamber's tax department stresses these cardinal principles in its Tax Control work:

1. We work *with* and *not against* public officials.
2. We do not take sides in controversies over sources of revenue.
3. We do not take sides in personal candidacies for office.
4. We emphasize centralized purchasing of supplies on competitive bids.
5. We work to keep down the tax bill without favoritism to any special group.
6. We make tax surveys to give taxpayers simple, comparable statements on debts and costs.
7. We stress budget control. This includes helping public officials prepare budgets, checking budgets, helping hold public hearings on budgets, and urging strict compliance with adopted budgets.
8. We urge other counties to adopt the successful Harrison County unit system of road and bridge administration.

## AMMONIA COMPRESSORS—

Bulletin No. 112-G—"Ice and Frost," attractively illustrated in colors and devoted to Frick Enclosed-Type Ammonia Compressors and other refrigerating equipment. Frick Company, Waynesboro, Pa.

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When you use a Davis Cypress tank. They last indefinitely and seem to take care of themselves. Ask our customers (names on request). Send us your inquiries for wood pipe. Send for catalogue.



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By making concrete pipe on the job with Quinn Forms you give more men more work, can use less experienced labor and produce uniform concrete pipe of highest quality. Recognized standard of all concrete pipe.



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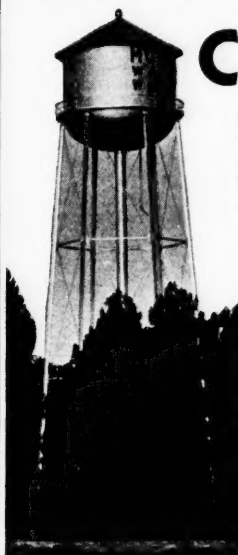
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Many municipal or privately owned water works have had us build tanks and elevated towers to specification from their own engineer's design or ours. Some of the cities served are:

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(Million gallon tank)  
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In addition to water tanks we also build tanks for acid, dye, oil, creosote, chemicals, etc., as well as other fabricated products of Quality steel and alloy steel plate. Let us figure on your requirements.

An erection for Mobile Water Works

Write for "Tank Talk"—No R.D.

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Elevated Tanks	Bins
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Process Tanks	Dredge Pipe and Accessories
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*General Steel Plate Construction  
designed for your requirements.*

**Lancaster Iron Works Inc.**  
Lancaster, Pa.

## Defense Program Awards in the South

(Continued from page 50)

"	"	Layne-Atlantic Co.—Norfolk .....	Water well, Marine Barracks, Parris Island, S. C. ....	40,000.00
Supplies & Accts.	"	A. T. Massey Coal Co., Richmond .....	Coal, nut and slack .....	41,481.00
"	"	Taylor Parker Co.—Norfolk .....	Twist drills .....	16,292.88
"	"	Virginia Smokeless Coal Co., Tazewell .....	Coal .....	311,695.00
"	"	Berkley Coal Co.—Norfolk .....	Coal .....	19,712.00
"	"	Reynolds Metals Co., Richmond .....	Pigment, aluminum .....	15,790.00
"	"	O. T. Graham & Co., Inc., Richmond .....	For torpedo shop & storage at the Naval Mine Depot, Yorktown ....	68,700.00
"	"	Chicago Bridge & Iron Co., Phila., Pa. ....	Elevated steel tank at the Norfolk Navy Yard, Portsmouth .....	12,940.00
		Est. cost of 7 Naval Vessels contracted for with Norfolk Navy Yard and Newport News Shipbuilding & Dry Dock Co., between June 13—July 12 .....		234,600,000.00
		Construction, utilities, roads .....	(Army) Arlington Cantonment ....	50,000.00
		Construction, utilities, roads .....	(Army) Fort Myer .....	50,000.00
		Construction, utilities, roads .....	(Army) Big Bethel (York, Warwick and Eliz. City Counties) .....	50,000.00
		Construction, utilities, roads .....	(Army) Front Royal Qmnt. Depot .....	40,000.00
		Construction, utilities, roads .....	(Army) Ft. Monroe—Old Point Comfort .....	100,000.00
		Construction, utilities, roads .....	(Army) Arlington Nat'l Cemetery..	43,103.00
		Construction, utilities, roads .....	(Navy) Norfolk Naval Sta. ....	600,000.00
		Construction, utilities, roads .....	(Navy) Norfolk Navy Yard .....	500,000.00
		Construction of 500 dwelling units .....	Newport News—loan .....	1,806,000.00
		Construction of 600 dwelling units .....	Portsmouth—loan .....	2,160,000.00
Marine Corps		The Logan & Kanawha Coal Co., Norfolk .....	Bituminous coal .....	20,000.00
<b>WEST VIRGINIA</b>				
Supplies & Accts.	"	Blue Jay Mfg. Co.—Huntington .....	Dungarees .....	91,500.00
"	"	The Consolidated Expanded Metals Co.—Wheeling ....	Metal .....	19,451.95
"	"	Weirton Steel Co., Weirton .....	Steel, sheet .....	17,840.51
"	"	Blue Jay Mfg. Co., Huntington .....	Jumpers & trousers, dungaree .....	96,150.00
"	"	Wheeling Corrugating Co., Wheeling .....	Buckets, iron or steel .....	22,616.01

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Only highest grades of crushed

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About 275 acres—core drilled by Richard K. Meade & Co., Industrial Engineers, of Baltimore. Estimated to contain 75,000,000 cu. ft. superior soapstone. Also considerable talc.

Report upon request. Cores may be seen on the property.

Apply to D. N. Davidson, Orange, Virginia

## CLASSIFIED . . . . OPPORTUNITIES

### ■ Factory Sites

Leitchfield, Ky., population with suburbs, 2300—located 55 miles S. W. Camp Knox on I. C. R. R. connected with 2 High Type Highways. Plenty water—gas—power and labor available. factory site donated—exempted from City taxation for five years. Write Zay Jones, Mayor.

A community free of all labor troubles, anxious for industry, can offer cement building ideally located on side tracks of main line of Seaboard Railroad. Tax exemptions, with plentiful supply of Southern Pine and Hardwoods available. Write, wire or phone Andrews Civic Club, Andrews, South Carolina.

For Sale: Factory site on edge small town Rock Spring, Georgia. 76 acres, power, water, highway, high location for reservoir, people anxious for city water. Address J. Frank Wellborn, Rock Spring, Georgia.

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SOUTHERN MANUFACTURING EXCEEDS ELEVEN BILLIONS ANNUALLY. Brand new manufacturing plant located in progressive industrial and agricultural section of northern Mississippi. Reinforced steel and brick construction building 80 x 150 feet—two stories with twenty thousand square feet of floor space. Wired for light and power. Equipped with sprinkler system, steam heat and freight elevator. Located on main line of Mobile & Ohio Railroad and paved highway extending from Gulf to Great Lakes. Ample supply of white and colored labor. Reasonable concessions and fullest cooperation offered to interested parties.

For further particulars address,  
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OKOLONA, MISS.

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TEXTILE ENGINEER  
Textile Engineer with a degree from a southern institution with two to five years' experience in cotton manufacture. Position available with a large industrial company in work involving sales contacts. Should be familiar with the manufacture and fabrication of synthetics, straight and in combination with other textiles. Sales personality particularly desired.

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1—18" Bignall & Keeler Pipe Threading Machine equipped with Landis Die Head.  
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## SOUTH CAROLINA POWER CO.

CHARLESTON, S. C.

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Nearest American Port to Mexico  
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Ores and chemicals adjacent in  
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Write for Industrial Survey

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170 KVA 3 P., 60 C., 2300 V. WORTH-ING DIESEL UNIT.

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2-Koehring 27-E paving mixers.  
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6000' Blaw Knox 9"x9" road forms.  
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2-Parsons Model 21 trenchers, 18"x7 ft.  
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2-110 cu. ft. Worthington air comprs., on Model A ½ ton Ford trucks with pneu. tires.  
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1-Set Allis-Chalmers 42"x16" smooth face crushing rolls, type "B".

**HOISTS (Elec., Gas, Steam)**  
55-Electric ranging from 20 HP up to 125 HP, consisting of triple-drum, double-drum and single-drum, with AC or DC motors, some with attached swingers. Following makes: American, Clyde, Lambert, Lidgerwood, Thomas.  
Gas hoists ranging from 8 to 120 HP, single, double and triple-drums; all standard makes. (38 in stock).

Send for Complete Stock List.

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300 KW. Ridgway 250 v. 2300/3/60 M.G. Syn.  
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150 KW. West. 250 v. 2300/4000/3/60 M.G. Syn.  
100 KW. Ridg. 250 v. 2300/3/60 M.G. Syn.  
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45 KW. West. 250 v. 220/440 M.G. Syn.

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3-219 kva G.E. Buckeye DIESEL 2300 v. (Can be reconnected for 440 or 220 v.)  
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45 kva G.E. 220/410/3/60 1200 rpm. 80% P.F.  
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(Continued from page 57)

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Office Publication—"The News Bag", H. E. Horberger, Editor, issued for September, 1940; carries leading article on "Problems of the Schools in Tuscaloosa and Tuscaloosa County" by Dr. H. G. Dowling, Superintendent of Tuscaloosa Schools; related by Dr. Dowling and Rayburn J. Fisher, County Superintendent.

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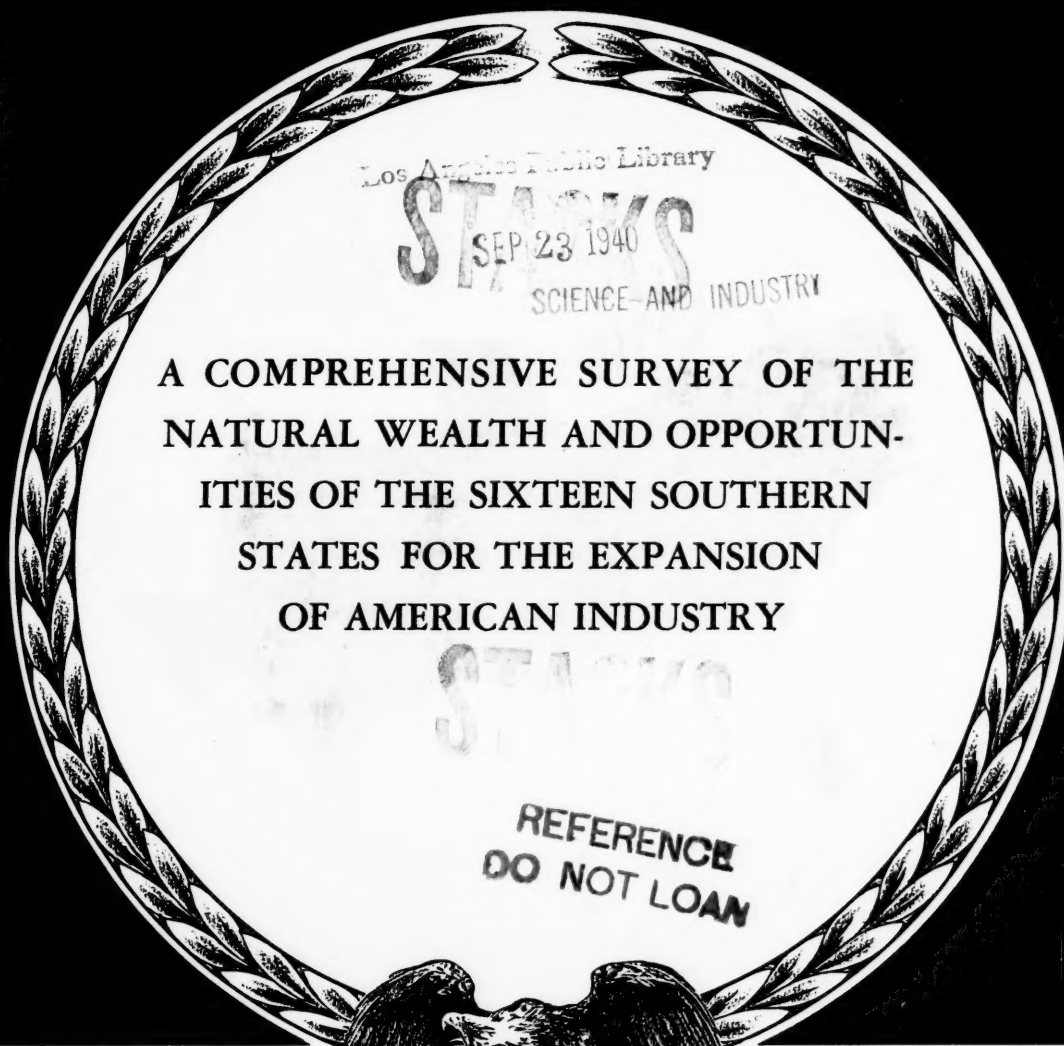
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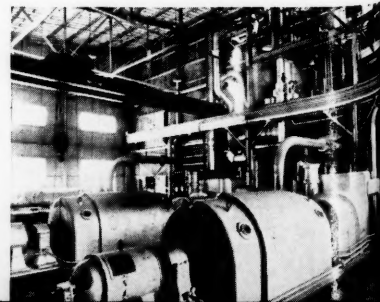


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September 1940

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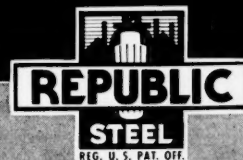
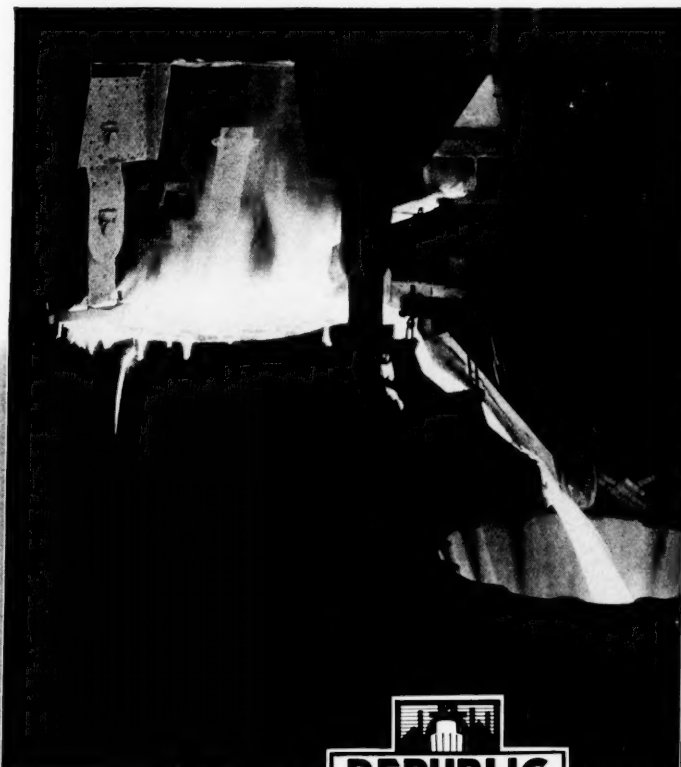
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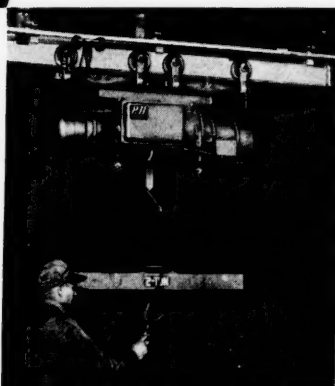


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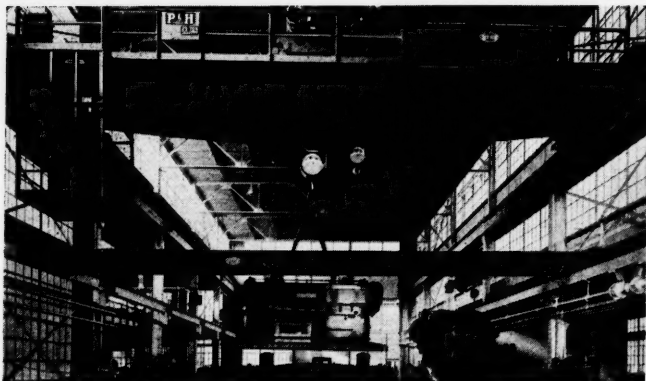
● Whatever product you make, the materials that go into it... the movement from one stage to another... the assembly of parts... even the product in its final form — all require handling. Many of these moves can best be done "thru the air" — the only method by which loads can be lifted, transported and lowered exactly where you want them without re-handling. P&H Engineers have cut costs in hundreds of plants with faster, simpler handling methods. They can help you. Write for full details.



**P&H HEVI-LIFT HOISTS** — all sizes and types up to 15 tons capacity; with all types of controls, including variable speed push-button. Their many uses are described in Bulletin H-5.



**P&H ZIP-LIFT HOISTS** — so low in price as to make hand-operated hoists obsolete. For loads up to 1000 lbs., easily installed on hook, jib or trolley. Ask for Bulletin H-1 and H-2.



**P&H ELECTRIC CRANES** — offered in all capacities up to 350 tons. P&H is America's oldest and only crane builder producing complete electrical crane equipment. Described in Bulletin C-3.



**P&H TRAV-LIFT CRANES** — for lower cost and simpler operation in intermittent crane service, handling loads up to 15 tons. With all types of controls including variable speed push-button. Ask for Bulletin H-13.

4427 W. National Avenue, Milwaukee, Wis.

# HARNISCHFEGER

## CORPORATION

ELECTRIC CRANES • EXCAVATORS • ARC WELDERS



HOISTS • WELDING ELECTRODES • MOTORS



## WHITCOMB LOCOMOTIVES IN THE SOUTH

In April 1906 the first Whitcomb internal combustion locomotive was built. Since then Whitcomb has convinced a worldwide market of its high standards of design and workmanship. Numerous Whitcomb locomotives are operating in the South and their impressive performance has won many friends.

The locomotive illustrated is a 50-ton Diesel electric recently placed in service at the plant of the Scullin Steel Company, St. Louis, Missouri. This design has been developed especially for heavy duty steel mill and industrial plant switching. Notice the rugged, sturdy construction. It's built to take it.

Diesel electrics in switching service have proven economies which show operating expenses cut 50 percent or more. The high thermal efficiency of the Diesel engine is ten times that of a comparable steam locomotive which results in a saving of approximately 75 percent in the cost of fuel. Repair costs of the Diesel electric range from 35 to 50 percent less. Diesel electrics provide full tractive power at the start, insuring quick acceleration which reduces the average time for handling cars at least 25 percent. This factor, combined with an average availability of 96 percent, makes it possible for the Diesel electric to do as much work as was formerly handled by two steam locomotives.



**DIESEL — GASOLINE — ELECTRIC**

**THE WHITCOMB LOCOMOTIVE CO.**

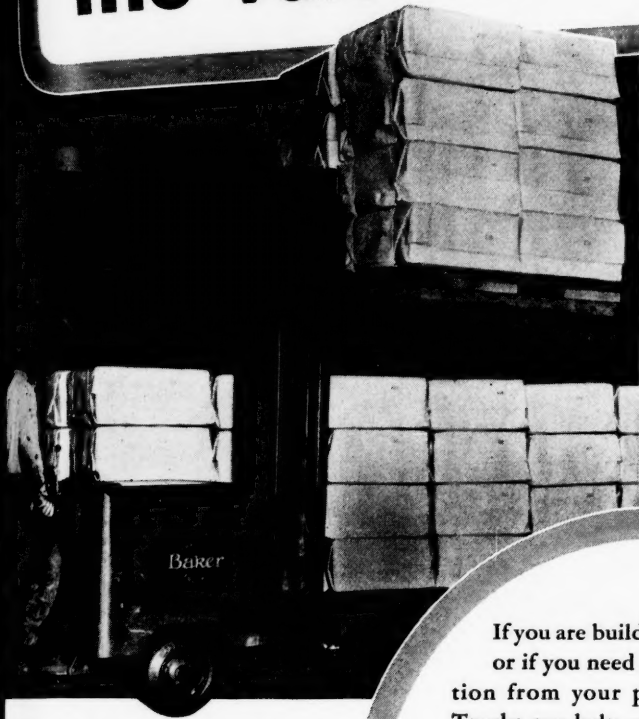
*Subsidiary of* **ROCHELLE, ILL.**  
**THE BALDWIN LOCOMOTIVE WORKS**

Two- or three-  
Hy-Lift Tr  
value of ste  
additional  
production.

No cluttered  
this plant, w  
bring the wo  
and take it a

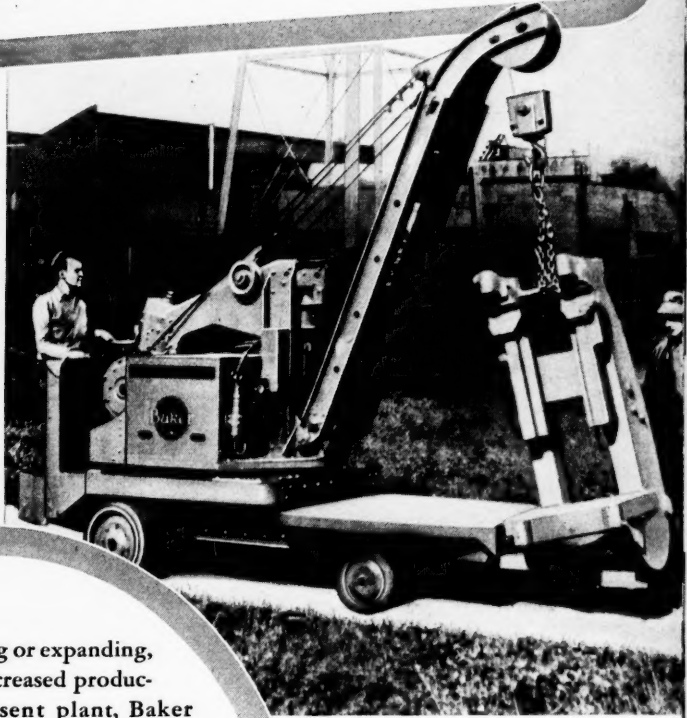
B

# BAKER TRUCKS Multiply the Value of Plant Floor Space



Two- or three-high tiering with Baker Hy-Lift Trucks doubles or triples the value of storage floor space, making additional plant space available for production.

No cluttered aisles or production jams in this plant, where Baker Elevating Trucks bring the work right up to the machine, and take it away when finished.

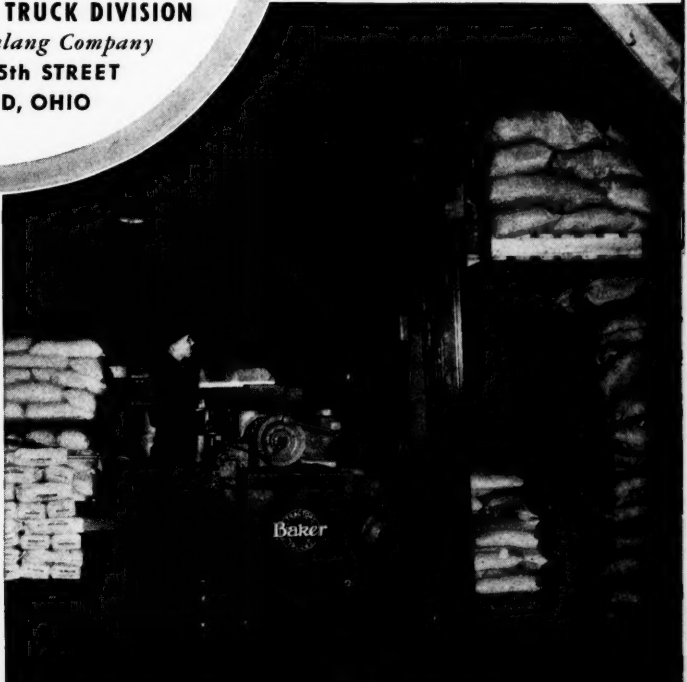
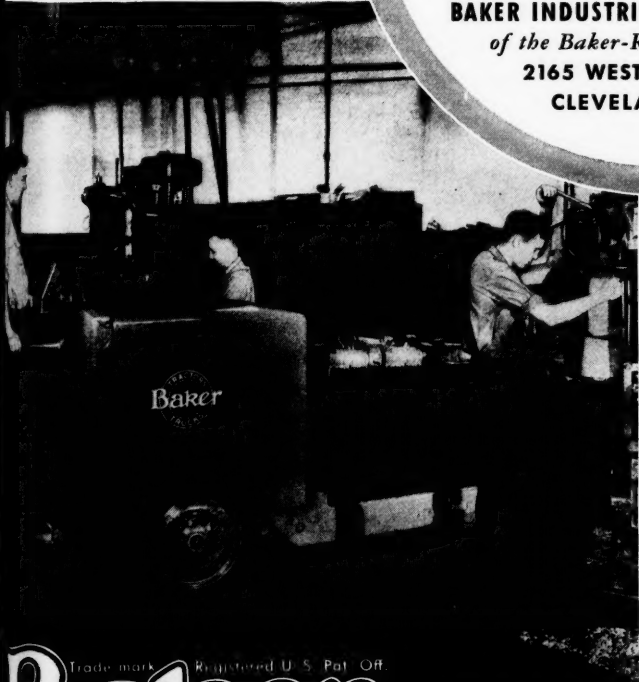


Baker Crane Trucks store heavy pieces in idle yard space, freeing inside floor space for production. One hundred feet is as near as ten feet with a Baker Truck.

Tiering sacks of flour or sugar to the ceiling is a difficult job. Baker Tilting Telescoping Fork Trucks do it quickly, safely and efficiently in this large food warehouse.

If you are building or expanding, or if you need increased production from your present plant, Baker Trucks can help you make the most of your floor space. Here are four typical cases, taken from hundreds in our files, where this has been done... Baker offers the services of a material handling expert to work with you toward reduced overhead and greater production efficiency.

**BAKER INDUSTRIAL TRUCK DIVISION**  
of the Baker-Raulang Company  
2165 WEST 25th STREET  
CLEVELAND, OHIO



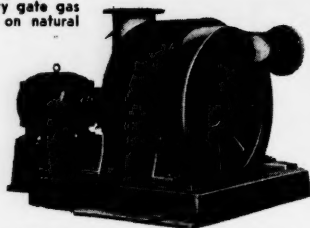
Trade mark Registered U. S. Pat. Off.  
**Baker**

**INDUSTRIAL TRUCKS**

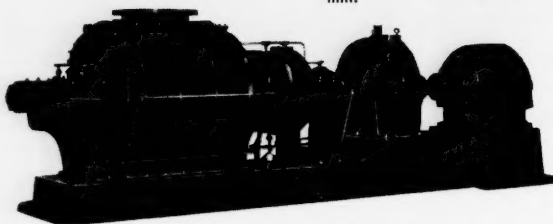




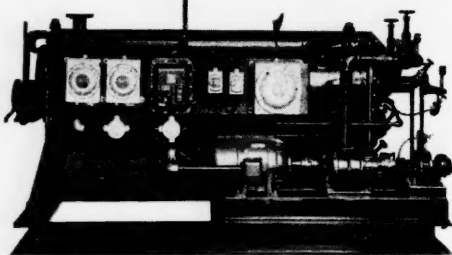
200,000 cu. ft. per hour displacement, 125-lb. pressure, city gate gas meter used on natural gas line.



1200 CFM, 5-lb. centrifugal blower used for yarn drying in southern cotton mill.



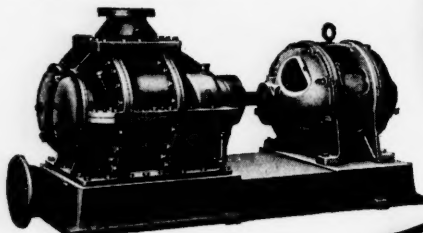
Heavy duty gas pump used in sulphuric acid plant, capacity 10,700 CFM at 76" water column.



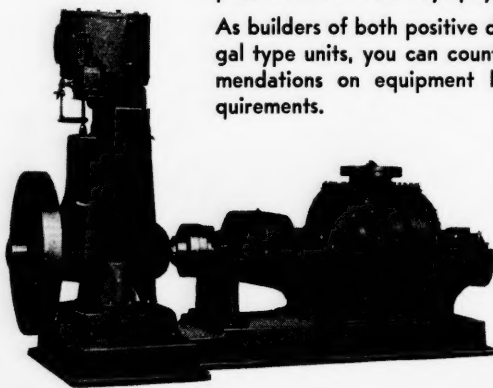
3000 cu. ft. per hour inert gas generator used for prevention of fire and explosion in large oil refinery.



Blower, V-belt driven from motor, used to supply blast to foundry cupola.

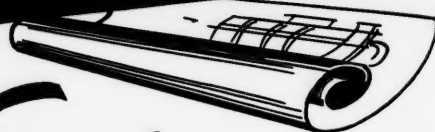


Direct connected motor driven vacuum pump for southern kraft mill, capacity 1000 CFM, 20" mercury vacuum.



Steam engine driven gas booster for manufactured gas plant.

# AIR and GAS Handling Equipment



## Engineered

### TO FIT YOUR NEEDS

Industrial progress in the South rests solidly on a broad foundation of natural advantages and resources. You have much to build upon.

So too with the constant development that keeps Roots-Connersville air and gas handling equipment abreast of the times. The basic principle first applied to blower design in the original Roots Positive Displacement Blower has proved its broad adaptability to modern industry.

Roots-Connersville blowers, exhausters, liquid and vacuum pumps, meters, inert gas generators, and other equipment designed for the specific job on which you plan to use them always pay their way.

As builders of both positive displacement and centrifugal type units, you can count on our unbiased recommendations on equipment best suited for your requirements.

# Roots

## CONNERSVILLE

### BLOWER CORPORATION

406 California Ave.

Connorsville, Indiana



NEW YORK CHICAGO POTTSTOWN, PA. SAN FRANCISCO DETROIT ST. LOUIS LOS ANGELES PITTSBURGH BOSTON



Automotive parts plant  
**MONORAIL PAY!**

**Chemical plant**  
Costs reduced 75% by handling waste directly from process to dump without transfer.

**Warehouse**  
Heavy cases stored in with the former time. System pays for itself within three months after installation.

**Textile mill**  
Rolls of cloth automatically transferred from floor to floor saving \$240 each year.

**Belt factory**  
Cost of handling rod in rolls reduced from 40¢ per ton to 8½¢ per ton with monorail system.

**Malleable foundry**  
Special monorail loop permits dumping of annealing pots in 36% of the former time.

**Steel fabricator**  
40,000 tons of steel handled over the system in two years at a cost of 10¢ per ton.

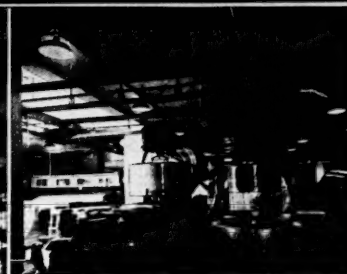
## "Tailor-made" systems from standard parts!

Every American MonoRail system meets a special need. It must be "made-to-order". But even the most elaborate installation consists in greater part of standard units fabricated with special accessories into a co-ordinated, smooth-working system.

No high initial costs need pile up. A few feet of track, a trolley and hoist, often serve as the starting point. Extensions here and there, until department after department link together, unite eventually into complete overhead service.

Flexibility alone in American MonoRail standard parts makes possible such application. It permits engineers to adapt devices for weighing—dipping—loading—transferring—many entirely automatic, without excessive structural changes.

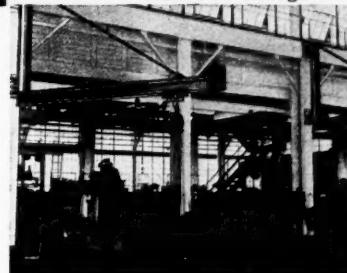
These features are fully described in a 254 page book used as a technical reference for overhead handling problems. Copy, as well as complete engineering service, is available without obligation.



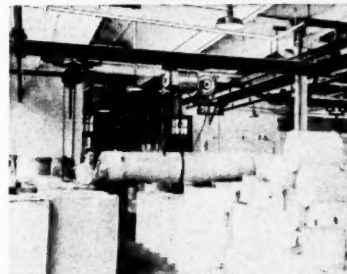
Over laundry extractors



Brass rod storage



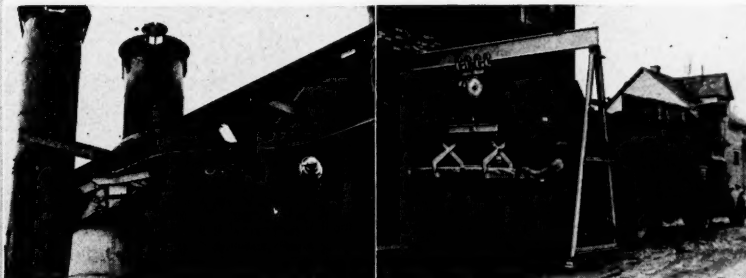
For machine service



In paper warehouse



Chlorination plant



Cupola charger unit

Unloading sheet steel

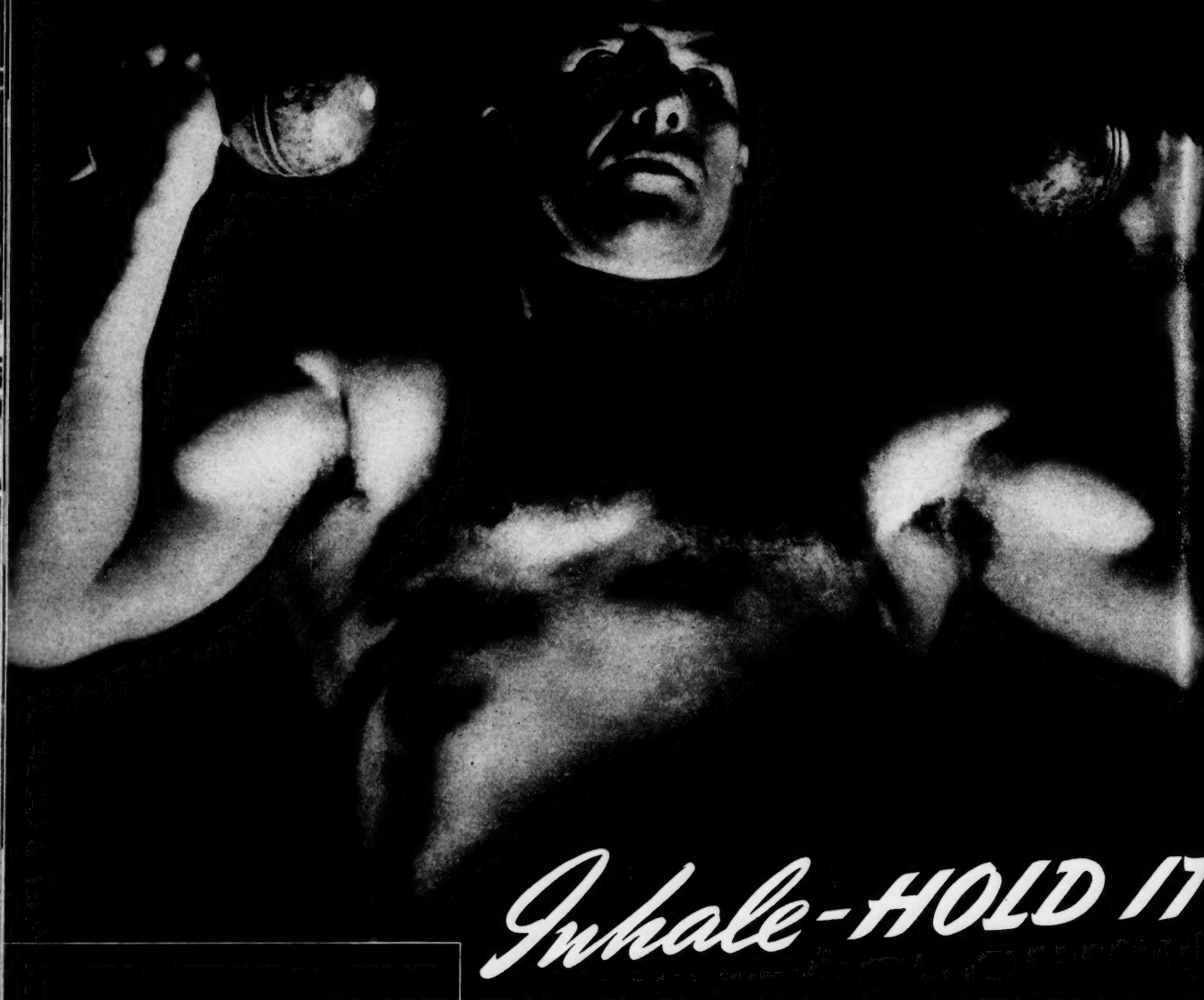


Outside coil storage



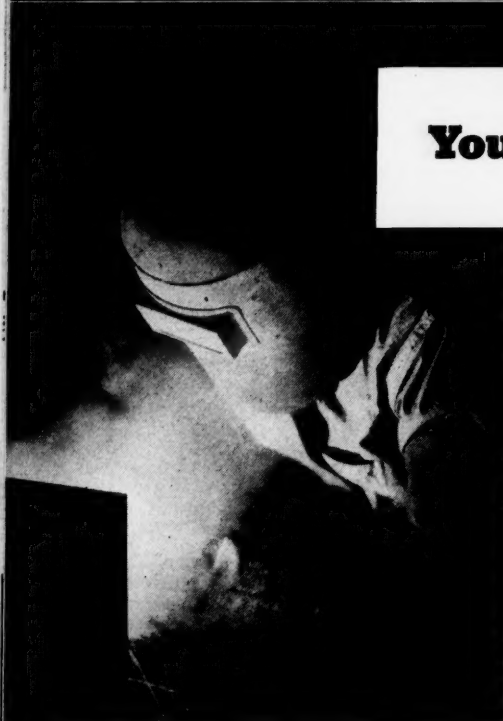
# AMERICAN MONORAIL

13107 Athens Ave., Cleveland, Ohio



*Inhale-HOLD IT*

**You need FRESH AIR in business, too**



**G**ET THAT LIFT—feel that tingle of new pep and energy pouring into every muscle . . . Breathe deep of life-giving FRESH AIR (try it) . . . "Inhale! Hold it!"

There's your demonstration on a small scale of what fresh air can do for your plant or industry! Fresh air is the greatest single asset to any business—peps up production—prevents summertime slumps in output—builds energy.

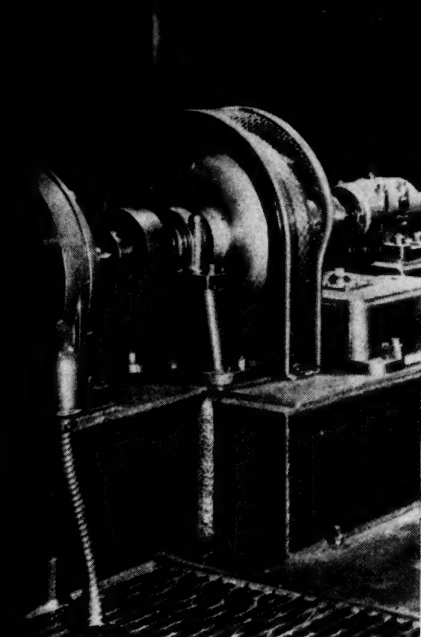
For over 59 years, American Blower has specialized in developing and building air handling and conditioning equipment of all kinds. And we have a story on recent developments in Comfort Cooling and Electric Ventilation for your plant or business that means more money for you! Phone or write for our FREE 48-page book, A-32029 . . . And remember—if you need any product that has to do with air handling—ask for American Blower!

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Also a

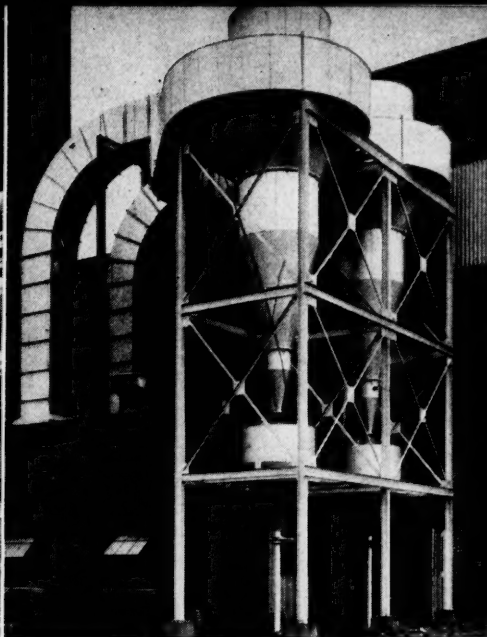
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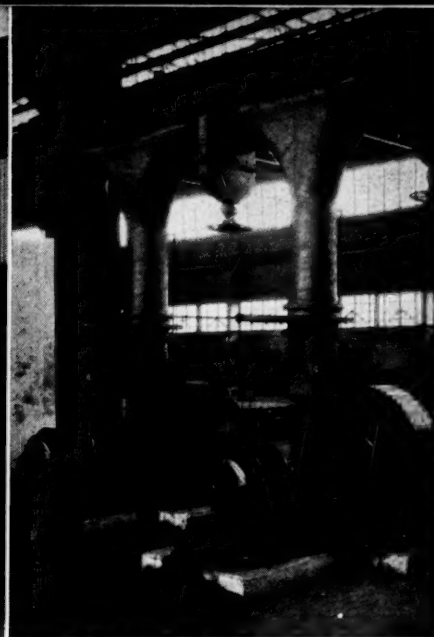




**American Blower Fluid Drives** (Hydraulic Couplings) provide smooth transmission of torque, through oil, without mechanical connection between driving and driven members! No starting shock, no stalling of engines or motors. Also an ideal variable speed control.



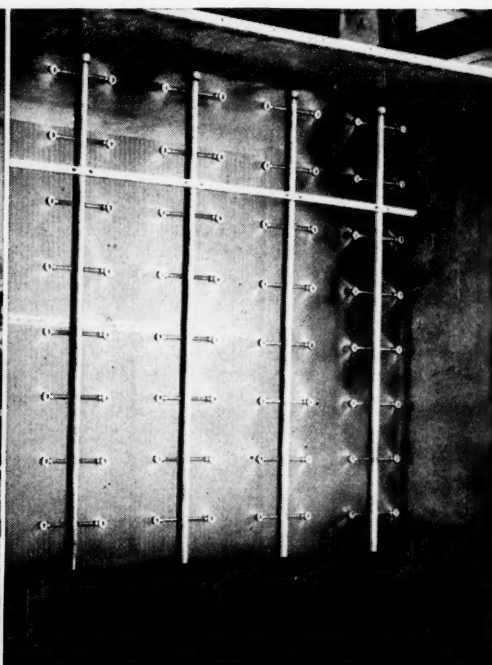
**A Better Way to Deal With Dust**—American Blower Dust Collectors and Precipitators! Many industries and power plants have had their dust problem effectively solved by American Blower. You can, too! Phone or write for data on practical, space-saving, economical dust equipment.



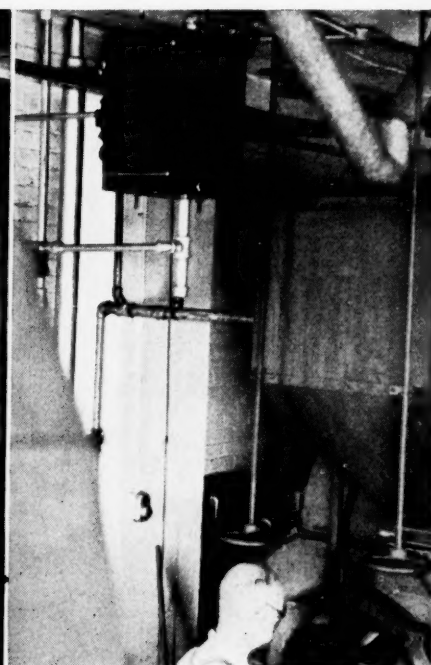
**Need Industrial Fans, Blowers or Exhausters?** American Blower has them to meet every requirement. Why not tell our engineers of your problem and get complete data on American Blower air handling equipment designed to do your particular job better?



**Comfort Cooling With Fresh Air** clears the way for faster, better work! It works wonders, cooling two ways—by evaporation and air motion. Join the fresh air progress parade now! Call in the nearest American Blower dealer for a free, Comfort Cooling survey of your plant or business. Buy the best—buy American Blower!



**Air Washers, Humidifiers, Dehumidifiers and Capillary Air Washers** by American Blower offer tremendous comfort and health advantages. Also proved an effective way of dust removal, humidifying and cooling for many industrial processes. The American Blower complete line includes types and sizes to meet every individual industrial need.



**American Blower Unit Heaters** are successfully keeping airplane hangars, foundries, factories, garages and other large areas comfortably warm in coldest weather. A complete range of capacities in sound-rated Venturafin Units (with propeller fan) and "ABC" Centrifugal Units.

For every problem of air handling, dust collection, mechanical draft, phone the nearest American Blower Branch Office.  
Engineers: Let us give you the facts on Fluid Drive.



# AMERICAN BLOWER

AMERICAN BLOWER CORPORATION, 6000 RUSSELL ST., DETROIT, MICH.

Division of American Radiator and Standard Sanitary Corp. • IN CANADA: Canadian Sirocco Co., Ltd., Windsor, Ontario

## FAIRBANKS-MORSE AND THE SOUTH

It is with a deep sense of satisfaction that we of Fairbanks-Morse welcome this opportunity to recognize the continuing progress of the South during the last half century. For Fairbanks-Morse have been closely identified with this progress, serving your Industrial, Agricultural and Municipal interests.

Our close association with the South through these many years has been both a privilege and a responsibility—a privilege as we served your recognized needs—a responsibility to improve on old products and develop new ones to meet the requirements of changing times and conditions. That this responsibility has been met is evidenced by the wide acceptance of Fairbanks-Morse products throughout the South.

Southern Industry depends on Fairbanks-Morse Diesel Engines to furnish economical and dependable power—on Fairbanks Scales to weigh anything from a fraction of an ounce to a million pounds. Industrial pumping problems—the unusual as well as the usual—are solved with the application of one of the many different types and sizes of Fairbanks-Morse Pumps, and the complete line of F-M Electrical Machinery contributes to the efficient handling of many phases of production.

Southern Municipalities use Fairbanks-Morse Diesel Engines, Pumps and Motors in their Municipally owned Power, Light and Water Plants, bringing the consumer reliable service at lower cost.

Southern Agriculture, too, is served by Fairbanks-Morse—with small engines and windmills, pumps for all capacities and uses, the home light plant, the feed grinder and the famous Fairbanks scales.

We have constantly widened our facilities for service to the South, and at present, ten southern sales and service branches are strategically located for quick response to Southern needs. And today, as in the past, we are dedicated to the purpose of meeting Southern equipment requirements economically—pledged to contribute what we may to the future progress of the South.



**FAIRBANKS, MORSE & CO.**

**CHICAGO, ILL.**

### SOUTHERN BRANCHES

Atlanta, Ga.	Memphis, Tenn.	Dallas, Tex.	Louisville, Ky.
St. Louis, Mo.	Baltimore, Md.	Cincinnati, Ohio.	
New Orleans, La.	Jacksonville, Fla.	Stuttgart, Ark.	

# United States Fire Insurance Company of New York

Organized 1824

## FINANCIAL STATEMENT AS OF DECEMBER 31, 1939

### ASSETS LIABILITIES

Cash in Banks and Trust Com-  
panies . . . . . \$5,633,953.58

United States Government  
Bonds . . . . . 9,561,838.63

Other Bonds and Stocks . . 17,308,798.98

Mortgage Loans on Real  
Estate . . . . . 261,672.51

Real Estate . . . . . 368,217.38

Premiums in Course of Collec-  
tion (Not over 90 Days) . . 1,131,357.81

Bills Receivable, Not Due . . 158,085.93

Interest Accrued . . . . . 75,788.57

Other Assets . . . . . 45,219.69

**TOTAL ADMITTED ASSETS . \$34,544,933.08**

Reserve for Unearned  
Premiums . . . . . \$10,217,865.04

Reserve for Losses in Process  
of Adjustment . . . . . 1,507,397.00

Other Liabilities . . . . . 761,468.39

Mortgage Reserve . . . . . 50,000.00

Capital . . . \$2,000,000.00

Net Surplus . . 20,008,202.65

**SURPLUS TO POLICYHOLDERS . 22,008,202.65**

**\$34,544,933.08**

On the basis of December 31, 1939 Market quotations for all Bonds and Stocks owned, the total admitted assets and surplus would be increased by \$730,579.39. Securities carried at \$3,200,590.35 in the above statement are deposited as required by law.

**SOUTHERN DEPARTMENT** Hines Brothers, Managers, 771 Spring Street, N.W., Atlanta, Ga.

### SERVICE OFFICES

604 Protective Life Bldg., Birmingham, Ala.  
229-230 Commercial Nat'l Bank Bldg.,  
Little Rock, Ark.  
418 Exchange Bldg., Orlando, Fla.

605 Security Trust Bldg., Lexington, Ky.  
621 Maritime Bldg., New Orleans, La.  
1021-22 Lampton Bldg., Jackson, Miss.  
624 Stahlman Bldg., Nashville, Tenn.  
730 Chronicle Bldg., Houston, Tex.

202 Great Nat'l Life Bldg., Dallas, Tex.  
1622 Cedarcrest Drive, Box 23, Abilene, Tex.  
Burk Burnett Bldg., Fort Worth, Tex.  
524 Aztec Bldg., San Antonio, Tex.

*"Firmly planted*



*in the South"*

**116 YEARS OF INSURING PROPERTY VALUES**

SOUTH'S RESOURCES ISSUE

17





# In the South

## YOU'RE ALWAYS NEAR TO CRANE SERVICE

**S**TRATEGICALLY located throughout the 16 Southern states, 340 Crane Branches and Wholesalers serve industry in the South. From well-stocked warehouses, these outlets render a most comprehensive and vital service in the development of the South's many rich resources.

The length and breadth of the Crane line permits proper selection of valves, fittings, and piping accessories for each individual applica-

tion. And Crane-Quality, resulting from more than 85 years of manufacturing experience, assures dependable and economical performance from these products.

Whether you need a single item or a carload of flow-control equipment, there's a Crane Branch or Wholesaler nearby to fill your order—accurately and swiftly. It will pay you to investigate the important economic advantages of Crane Quality and Crane Service.



# CRANE

CRANE CO., GENERAL OFFICES:  
836 S. MICHIGAN AVE., CHICAGO  
VALVES • FITTINGS • PIPE  
PLUMBING • HEATING • PUMPS

NATION-WIDE SERVICE THROUGH BRANCHES AND WHOLESALE IN ALL MARKETS

Check off the ones you want

Postage  
Will be Paid  
by  
Addressee

No  
Postage Stamp  
Necessary  
If Mailed in the  
United States

## BUSINESS REPLY CARD

FIRST CLASS PERMIT NO. 1046, SEC. 510 P. L. & R., PITTSBURGH, PA.

KOPPERS COMPANY

401 Koppers Building

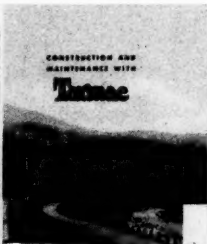
Pittsburgh, Pa.

Tear out and mail

No postage required

**THIS CARD WILL SHOW YOU**  
**how**  
**KOPPERS**  
**serves the south**

KOPPERS



### ROAD TARS

This booklet tells how to build every type of bituminous road with coal tars . . . do's and don'ts in road work . . . consistency tables . . . aggregate sizes, gradations and tests, etc. Send the card for your copy.

KOPPERS



### BRIDGE CONSTRUCTION

This booklet gives comparisons of costs of highway bridges of pressure-treated timber and other permanent materials . . . typical designs, cross sections, bills of materials, etc.

KOPPERS

KOPPERS MEMBRANE WATERPROOFING



### WATERPROOFING

These booklets tell you how to prevent leaks in foundations, tunnels, bridge floors, swimming pools, tanks, etc. . . how to protect concrete and masonry surfaces with dampproofing coatings. Send for copies.

SEE OTHER SIDE

**SEND THE CARD FOR THIS TECHNICAL INFORMATION**

KOPPERS COMPANY, 401 Koppers Building, Pittsburgh, Pa.

Please send me the following purchasing information:

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| <input type="checkbox"/> How to Measure the Quality of Pressure Treatments | <input type="checkbox"/> Tarmac for Industrial Driveways                   | <input type="checkbox"/> Typical Highway Bridges of Pressure-treated Timber |
| <input type="checkbox"/> Prevention of Termite Damage                      | <input type="checkbox"/> Construction and Maintenance with Tarmac          | <input type="checkbox"/> Industrial Boiler Plants                           |
| <input type="checkbox"/> Pressure-cresoted Poles                           | <input type="checkbox"/> How to Order Piston Rings                         | <input type="checkbox"/> Industrial Electric Power Plants                   |
| <input type="checkbox"/> Where to Use Pressure-Treated Timber              | <input type="checkbox"/> Piston Rings for Compressors                      | <input type="checkbox"/> Koppers-Rheolaveur Coal Cleaning Processes         |
| <input type="checkbox"/> Pressure-treated Highway Posts                    | <input type="checkbox"/> Piston Rings for Bearings                         | <input type="checkbox"/> Carpenter Centrifugal Driers                       |
| <input type="checkbox"/> Pressure-treated Car Lumber                       | <input type="checkbox"/> Piston Rings for Hydraulic Presses                | <input type="checkbox"/> Koppers Wedge Wire Screens                         |
| <input type="checkbox"/> Economics of Wood Preservation                    | <input type="checkbox"/> Piston Rings for Diesel Motors                    | <input type="checkbox"/> Design and Construction of Tipplers                |
| <input type="checkbox"/> Membrane Waterproofing Instructions               | <input type="checkbox"/> Sectional Bronze Packing for Marine Steam Engines | <input type="checkbox"/> Operations Report on Benzol Plant                  |
| <input type="checkbox"/> Dampproofing                                      | <input type="checkbox"/> Piston Rings for Re-bore, Re-ring, Re-claim Jobs  | <input type="checkbox"/> Coke Ovens   |
| <input type="checkbox"/> Waterproofing and Dampproofing for Sewage Plants  | <input type="checkbox"/> Material Handling Systems                         | <input type="checkbox"/> Continuous Ammonium Sulfate Driers                 |
| <input type="checkbox"/> Waterproofing and Dampproofing for Water Works    | <input type="checkbox"/> Conveying Systems                                 | <input type="checkbox"/> D-H-S Bronze                                       |
| <input type="checkbox"/> Coal Tar Pitch Roofing Specifications             | <input type="checkbox"/> Fast's Self-aligning Couplings                    | <input type="checkbox"/> Hot Metal Transfer Cars                            |
| <input type="checkbox"/> Water-cooled Roofs                                | <input type="checkbox"/> Tar-base Paints                                   | <input type="checkbox"/> Products of Koppers and Affiliated Companies       |
| <input type="checkbox"/> How to Build Steep Roofs with Coal Tar            | <input type="checkbox"/> Painting of Cresoted Wood                         | <input type="checkbox"/> Creosote   |
| <input type="checkbox"/> Waterproofing Sidewalk Vaults                     | <input type="checkbox"/> Proper Coal for Stokers                           | <input type="checkbox"/> Disinfectants, Insecticides                        |
| <input type="checkbox"/> Waterproofing Shower Baths                        | <input type="checkbox"/> Proper Coal for Gas Plants                        | <input type="checkbox"/> Sodium Phenolate for Hydrogen Sulfide Removal      |
| <input type="checkbox"/> Waterproofing Tunnels Connecting Buildings        | <input type="checkbox"/> Proper Coal for Power Plants                      | <input type="checkbox"/> Oxide Boxes  |
|  | <input type="checkbox"/> Proper Coal for Coke Plants                       | <input type="checkbox"/> Automatic Time-cycle Controls                      |
|  | <input type="checkbox"/> Proper Coal for Domestic Use                      | <input type="checkbox"/> Fast's Self-aligning Couplings                     |
|  | <input type="checkbox"/> Proper Coal for Bunkers, Smithies, etc.           | <input type="checkbox"/> Koppax Black Tar-base Paint                        |

YOUR NAME .....

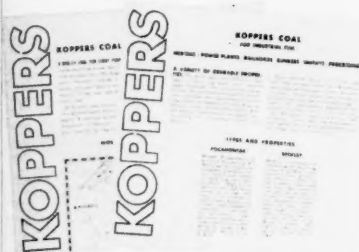
TITLE .....

COMPANY .....

ADDRESS .....

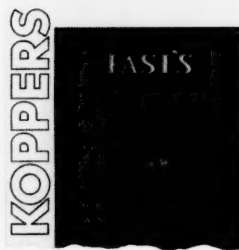
Send for it

DO YOU HAVE  
THIS PRODUCT  
INFORMATION  
IN YOUR FILES?



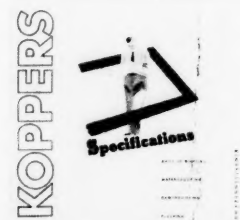
#### COAL

How to buy proper coals for various uses . . . how various coals rate as to ash, sulfur, etc. . . . how to buy the best coals for stokers . . . how the selection of coals can cut stack and flue maintenance.



#### FAST'S COUPLINGS

How to buy couplings to avoid frequent parts replacements . . . what couplings to buy when there is shaft misalignment . . . how to eliminate supporting bearings on extended shafts.



#### ROOFING

What types of roofing materials have the longest life . . . how to buy roofings that avoid leaks . . . facts about water-cooled roofs . . . effects of roofings on building temperatures, etc.



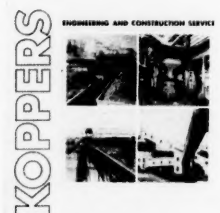
#### PRESSURE-TREATED TIMBER

How to prevent decay of timber members . . . how to prevent termite attack on new buildings . . . what to do about termites in old buildings . . . where to use pressure-treated timbers, etc.



#### PISTON RINGS

How to eliminate scuffing in compressors . . . how to reduce wear on piston rings and cylinders . . . how to prevent "blow-by" . . . how to cut oil consumption in motors . . . how to increase piston ring life.

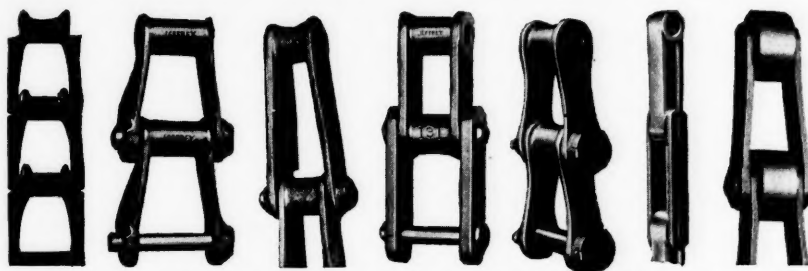


#### ENGINEERING, CONSTRUCTION

How to get the finest possible engineering service . . . how to get expert help with problems in designing, engineering, construction work . . . how to get appraisal estimates, power surveys, detail drawings



# JEFFREY GOES INTO EVERY INDUSTRY



Chains, sprockets, attachments, gears, take-ups, couplings, clutches, shafting, pulleys . . . a complete line for general service. A few types of chains are shown.

## WITH

A complete line of chains, material handling, reduction and mining equipment.

Chains—a type and size for every elevating, conveying and transmission need.

Conveyors—apron, belt, chain, drag chain, portable, electric vibrating, Mass-Flo, pivoted bucket, V-bucket, spiral, trolley, etc.

Crushers, pulverizers, grinders, hashers and shredders—a type and size for reducing all kinds of materials to desired fineness.

Elevators—any capacity with buckets continuously or intermittently spaced, with or without casings.

Electric vibrating units — feeders, screens, conveyors, dryers, coolers and barrel packers. Provide positive control over tonnage.

Feeders—apron, plate or electric vibrating.

Foundry equipment—erators, mold conveyors, flask fillers, screens, shake-outs, all types of sand handling and conditioning units.

Portable loaders and conveyors—scraper, belt and bucket types. Also car unloaders and mono-veyors.

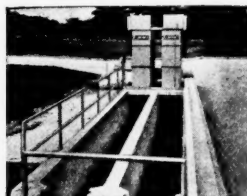
Power plant equipment—a complete line of coal and ashes handling units—conveyors, elevators, skip hoists, crushers, weigh tarries.

Sewage Disposal equipment—sludge collectors, grit channel conveyors, grit washers, self-cleaning bar screens and sewage screenings grinders.

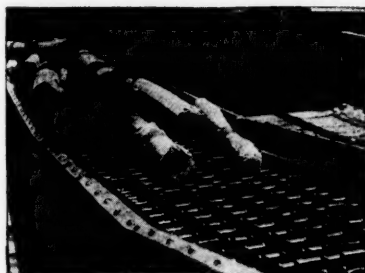
Also equipment for pulp and paper plants, saw mills, quarries, steel mills, water treatment plants, fertilizer plants, sugar refineries, cotton seed oil mills, oil well, rotary chains, coal preparation plants, coal and metal mines, etc.



Above—Jeffrey arm elevator handling paper rolls. Right—a semi-portable sanditioner for foundries.



Grit channel conveyors in a sewage disposal plant. Also sludge collectors, screens, grinders and grit washers.



Six strands of Hercules chain used as sorting conveyor in pulp and paper handling.



Spiral conveyor installation. A compact unit which can be made dust proof.

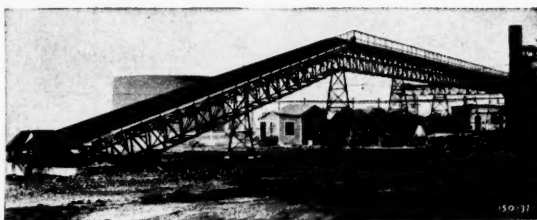


Belt conveyor (right) handling chips. Below—another belt conveyor installation in pulp and paper plant.

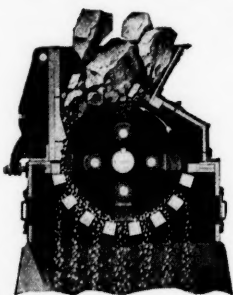
Right — a Jeffrey bucket loader for handling sand, gravel, cinders, etc. Wheel or crawler types. Also fertilizer digger and loaders.



Below—a vertical type bucket elevator. Also inclined elevators.



Left—miracle hammer crusher for reducing limestone, shale, etc. Right—Jeffrey-Traylor electric vibrating water-jacketed feeder handling hot lime.



We will be glad to send you engineering data or literature covering Jeffrey equipment. Write today.



## The Jeffrey Manufacturing Company

926-99 North Fourth Street, Columbus, Ohio

# GRUENDLER CRUSHER & PULVERIZER CO.

PLANT AND MAIN OFFICES 2920-30 NORTH MARKET STREET, SAINT LOUIS, MO.  
"ESTABLISHED 1885"

MAX MOSHER  
130 W. 42nd St., New York, N. Y.  
FRED GREAVES  
400 Polson Bldg., Seattle, Wash.

## GRUENDLER

CRUSHERS • PULVERIZERS • GRINDERS

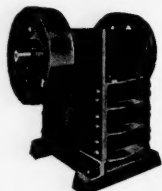
LEO FREEMAN  
1632 Olive St., Baton Rouge, La.  
MUSSEY MACHINERY CO.  
1156 W. 36th Place, Los Angeles, Cal.

Foreign Representative: J. ESTES, 175 5th Ave., New York, N. Y.

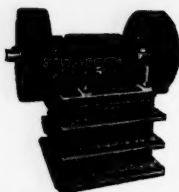
## Gruendler Portable and Stationary Rock Crushers

### For Maximum Reduction at the Lowest Cost Per Yard

Recognized by Federal, State, City and County Highway Engineers and Private Construction Companies as equipment embodying the most modern and efficient engineering, including ease of operation with complete safety.



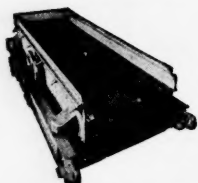
Heavy Armour Plate  
Steel Roller Bearing  
JAW CRUSHER.



All cast steel Roller  
Bearing JAW CRUSHER.



Trailer Type Maintenance  
JAW CRUSHER with  
Universal Drive.



VIBRATOR SCREENS  
in all sizes.



Heavy Duty Revolving  
Screens up to 84 inch  
diameter.



#### 1. Gruendler Portable Windrow Maintenance Jaw Crusher.

Heavy duty construction and easy mobility and low feeding, ideal in maintenance or repairs to roads where rock is available, from cuts of banks and sides of roads.

#### 2. Gruendler Portable Rock Crushing Plant with reject conveyor and bin.

Large capacity and most uniform crushed rock day in and out. Plant includes portable Jaw Crusher, drives, reject conveyor and necessary spouts for returning over size material to crusher for re-crushing.



Portable Crushing and Gravel Screening  
Plant. Capacity 60 yds. to 100 yds. per hr.

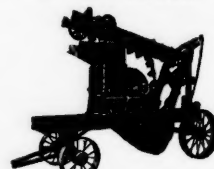
"Established 1885"



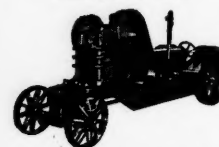
HAMMER CRUSHERS  
From 1 ton per hour to  
500 tons per hour  
Capacity.



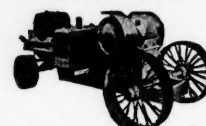
ROLL CRUSHERS from  
18" to 40" diameter.



Portable TWO-IN-ONE  
Hammer Mill for both  
Rock Crushing and  
Lime pulverizing.



Self Traveling Tractor  
Operated Maintenance  
JAW CRUSHER.



Four Wheel Maintenance  
JAW CRUSHER with  
Power Unit.

**FREE CATALOG  
and Specifications**  
Mailed on Written Request

**Consult our Engineering  
Department on any  
crushing problem con-  
fronting you.**

# GRUENDLER CRUSHER & PULVERIZER CO.

PLANT AND  
MAIN OFFICES

2920-30 NORTH MARKET STREET, SAINT LOUIS, MO.

"ESTABLISHED 1885"

MAX MOSHER  
130 W. 42nd St., New York, N. Y.  
FRED GREAVES  
400 Polson Bldg., Seattle, Wash.

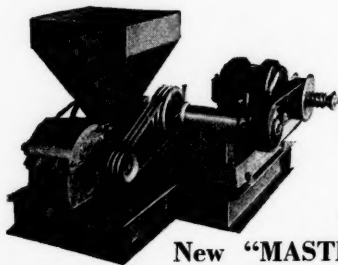
## GRUENDLER

CRUSHERS • PULVERIZERS • GRINDERS

LEO FREEMAN  
1632 Olive St., Baton Rouge, La.  
MUSSEY MACHINERY CO.  
1156 W. 36th Place, Los Angeles, Cal.

## Proven Process Equipment for the Farm Feed, Paper Pulp, Food, Chemical and Allied Industries

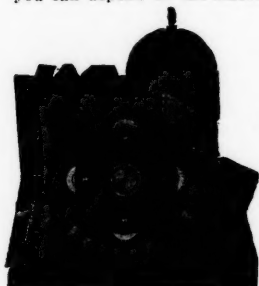
Manufactured in various sizes and types to meet different Products and Capacity Requirements.



BUILT  
IN MANY  
SIZES

### The New "MASTER" Food & Chemical Pulverizers

Finenesses from 30 mesh to 300 mesh. Requires no auxiliary Separators, fans or collection Equipment—its dustless operation and small power requirements make it a most popular type on the market. Whenever Dustless Fine Grinding in production is required you can depend on the Master.



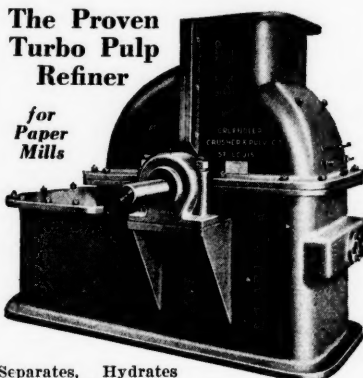
### Gruendler Famous Ring Hammer Coal Crusher

Built in  
many sizes

For Primary crushing of bituminous mine run coal to minus 4" at capacities to 5 tons per H.P. For secondary crushing of 4" Screen coal to minus 1" and Stoker sizes with minimum fines.

### The Proven Turbo Pulp Refiner

for  
Paper  
Mills

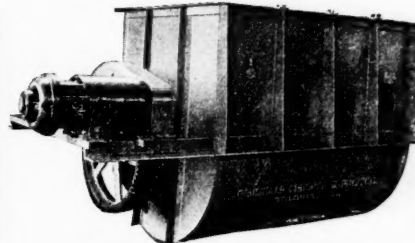


Separates, Hydrates Fibres, leaving a better refined pulp producing a tougher paper—Reduces power requirements to 50%—High mullen, high tear and greatly improved formation is given product by use of the Turbo Refiner.

### GRUENDLER Build Machinery for—

•  
CRUSHING  
GRINDING  
PULVERIZING  
SCREENING  
SEPARATING  
MIXING  
(Wet or Dry)  
PROPORTION-  
ING  
CONVEYING  
ELEVATING  
•

Consult our ENGI-  
NEERING DEPART-  
MENT. Information  
and data available  
for your particular  
problems.



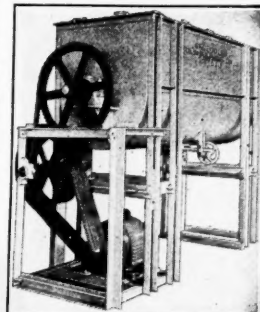
### BATCH TYPE MIXERS

For Materials, Dry, Wet, Liquid

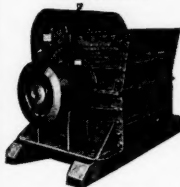
Manufactured from as small as 50 pounds per batch size to 4 tons per batch size. There is nothing in the mixing field that GRUENDLER cannot competently handle, dry, wet or Liquid. Write for Blue Prints and Specific Information.

### Large Batch Type Mixer

Note the effective arrangement of power transmission and foundation. The massive bearing support and rigid construction. (Stainless steel, Monelmetal or other non-corrosive materials used in construction where specified).

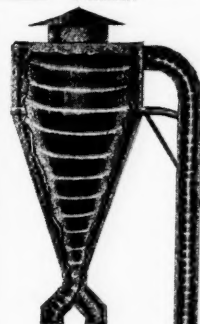


### Sewage Plant Shredders



Gruendler Shredder  
Installed in Atlanta, Ga.

Gruendler Shredder installed in Atlanta, Ga. has patented feature to handle rag stock and similar materials without choke downs so as to pass screen bar.

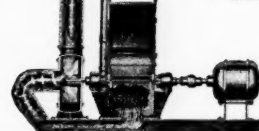


### HAMMER MILL TYPE

Sizes 5 H.P.—3 H.P. and Larger

### GRUENDLER NO. 1 FEED GRINDERS

Elevators, Millers and Farmers are finding GRUENDLER Mills pay large returns year in and out. The many swinging hammers with double end cutting edges reduce feed stuff to desired fineness. Furnished with 3 size-screen.



### THE GRUENDLER CRUSHER & PULVERIZER CO.

manufacturers of a complete line of Reduction Equipment to fit any requirement.

We maintain a complete testing laboratory for your benefit, in our factory, where samples of from 25 to 50 pounds of material will be run and a complete report submitted without charge. From these tests we are able to recommend the proper machine for the particular product and for the capacity desired. Send your material in for tests today.



A GRUENDLER  
Peerless Grain Grinder



# ROTARY KILNS



UNAX KILNS  
FOR  
LIME BURNING



UNAX KILNS  
FOR  
CEMENT



SINTERING KILNS  
FOR ORES, PHOSPHATES, ETC.

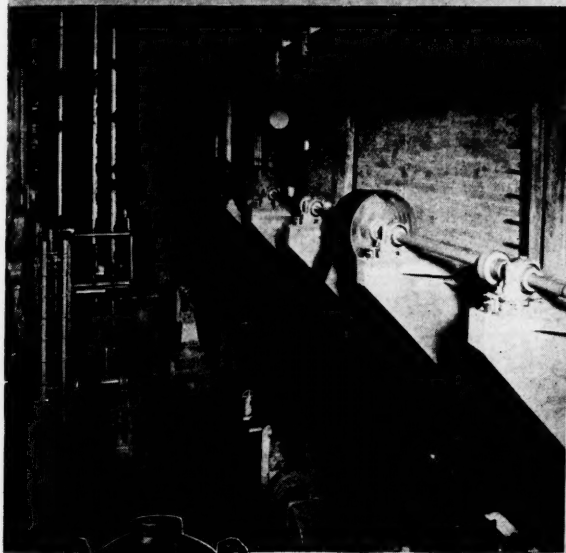
**F. L. SMIDTH & CO.**

60 EAST 42ND STREET

ENGINEERS

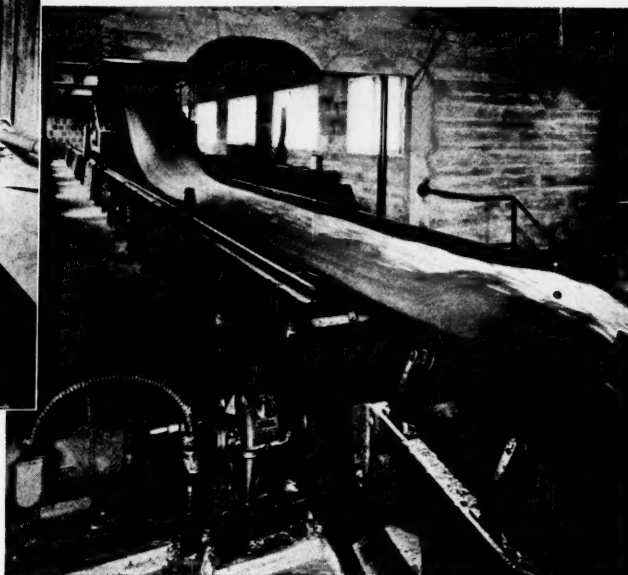
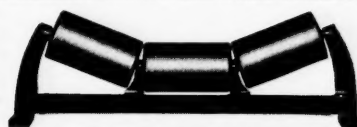
NEW YORK, N. Y.

## You Pay the Same for Power - - Delivered or Dissipated!



Lineshaft driving 134-inch pulp drying machine equipped with Dodge-Timken Pillow Blocks on adjustable base plates.

48-inch Dodge Belt Conveyor with "DND" Ball Bearing Steel Idlers and traveling tripper handling chips to digesters below.



## DODGE EQUIPMENT DELIVERS POWER EFFECTIVELY ... HELPS IN LOW-COST MATERIAL HANDLING

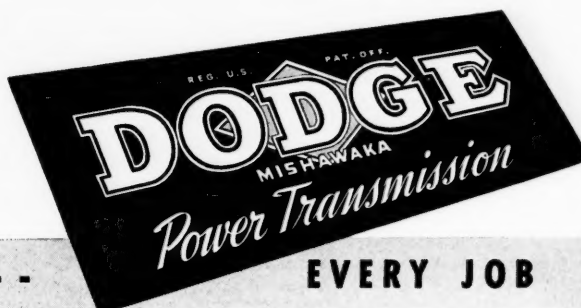
The new plant of Rayonier Incorporated at Fernandina, Florida, is completely equipped with Dodge Belt Conveyors and Dodge Power Transmission Equipment.

Dodge "DND" Ball Bearing Steel Idlers are used on all belt conveyors. These idlers are designed to afford extreme ruggedness and durability . . . ends of rolls cannot work loose . . . ball bearings are factory-sealed and pre-lubricated. Rolls are of heavy gauge steel and are interchangeable . . . they can be removed without disturbing stands.

Dodge belt conveying and power transmission equipment has won definite preference

in all branches of industry because of its ability to meet the exacting requirements of continuous operation under severe conditions. The Dodge line is complete and Dodge engineers are able to make unprejudiced recommendations which means the right equipment for every job.

**DODGE MANUFACTURING CORPORATION**  
MISHAWAKA, INDIANA, U. S. A.



**THE RIGHT DRIVE FOR - -**

**EVERY JOB**





# LINK-BELT

*proves its Faith*  
**in the SOUTH!**



↑ The modern structure shown above is the new Dallas plant and warehouse recently built by Link-Belt from which to service its distributors and customers in the Southwest.



← At the left is shown Link-Belt's Atlanta plant and warehouse which has, for many years, been serving the South.

**Link-Belt** Company believes the South has a great future. Its industrial development, which has been increasing so steadily, is both natural and logical, for this section of our nation enjoys many economic and climatic advantages. Years ago, Link-Belt realized that this

development was certain to come and set up distribution facilities at Atlanta and at Dallas. Today, we can offer a complete and immediate service to any southern distributor or user on any Link-Belt product. Our faith in the South has always been great—now, it is greater than ever!

## LINK-BELT COMPANY

Dallas Plant, 500 Latimer St. Atlanta Plant, 1116 Murphy Ave., S.W.  
New Orleans Baltimore Houston Distributors throughout the South

Other plants located at Chicago, Indianapolis, Philadelphia, San Francisco, Toronto. Offices, warehouses, and distributors located in principal cities.

8153

# LINK-BELT

CHAINS DRIVES ANTI-FRICTION BEARINGS POWER TRANSMISSION EQUIPMENT ELEVATORS CONVEYORS  
SKIP HOISTS CAR UNLOADERS DRYERS SCREENS CRUSHERS WASHING & CLEANING EQUIPMENT  
COAL STOKERS CRANES & SHOVELS SPROCKETS GEARS PULLEYS, ETC.

SOUTH'S RESOURCES ISSUE

27

## CONTROL PROBLEMS

Budgetary control . . . accounting procedures . . . clerical procedures . . . inventory . . . capital expenditures.

## SELLING PROBLEMS

Market analysis . . . merchandising procedures . . . distribution methods . . . market coverage . . . prices, terms, allowances and deliveries . . . sales forecasting and quotas.

## MANAGERIAL PROBLEMS

Profit-volume relationship and break-even point . . . suitability of product to market . . . potential sales volume . . . pricing . . . costing . . . organization and definition of departmental functions . . . compensation and incentives.

## MANUFACTURING PROBLEMS

Production control . . . labor control and policies . . . quality and inspection . . . manufacturing methods . . . plant layout . . . production facilities.

## ENGINEERING PROBLEMS

Design of product for greater consumer appeal . . . for substitution of cheaper materials . . . for cheaper assembly or fabrication . . . for better tooling or faster equipment . . . for better structural composition.

**M**ANAGEMENT requires good engineering. Engineering calls for good management. That's why Management Engineering is so vital to the profitable operation of your business. It embraces a comprehensive study of every problem listed above.

It is the function of The Trundle Engineering Company to study each of these vital problems—to make recommendations based upon these factual studies—and to put those recommendations into effect as a definite program aimed at surer and larger profits.

★

Write for our booklet No. A-1 which describes in detail the nature of the analysis of a company's problems made by our organization, and the method in which our organization functions in helping to solve those problems.

## THE TRUNDLE ENGINEERING COMPANY

General Offices: 400 Madison Avenue, New York 17, N.Y.

NEW YORK  
Grayson Building  
400 Madison Ave.

# FIBER BONDED MINERAL REINFORCED ASPHALT **INDUSTRIAL FLOORING**

*Developed by Servicised*

**Gives You the Rugged, Non-Skid Flooring You  
Want... AT THE VERY MINIMUM COST!...**



*The Ideal Surfacing for:*

FACTORY FLOORS  
LOADING & SHIPPING DOCKS  
WAREHOUSE FLOORS  
LOCKER ROOMS  
SUPER MARKETS  
LAUNDRY FLOORS  
GANGWAYS & RAMPS  
ROOF DECKS

## **CHECK THE MULTIPLE FEATURES:**

- Low Initial Cost—No Upkeep
- Speedily Installed by Unskilled Men Without Special Tools  
—Over Wood, Cement or Steel
- Factory Operation Need Not Be Interrupted—Tile is Ready  
for Use Immediately After Laying
- Non-Skid ● Non-Dusting ● Waterproof
- Acid and Alkali Resistant ● Vermin-Proof

*For Complete or Particular Details, Write*

# **SERVICISED PRODUCTS CORP.**

**6051 WEST 65th STREET**

**CHICAGO**

*—And for the Office and Reception Rooms . . . . .*

- SERVICISED EXCLUSIVE Tongue and Groove RUBBER TILE**
- STANDARD RUBBER TILE ● CORK TILE or
  - CORK RUBBER TILE





This composite view of Remington Rand's plants indicates their number and their scope. They are located at central points throughout the world to render a high standard of systems and mechanical service.

## The Keenest Brains in Business Must Know Before They Act!

### Records Become Management's Most Important Tool

How necessary are business records? Well, without them American industry could never have reached world dominance. Without them no giant corporation could govern its far flung staff. Men and women now supply the muscles and the brains. But business records are the sensitive nerve ducts which initiate an impulse to act.

This factor in management is the reason for Remington Rand. Remington Rand is the world's largest maker of business record systems and machines. It has been our privilege to serve many of America's greatest institutions — on many of the vital control problems of their managements. Certain phases of our experience are presented in the lines that follow.



#### *How Production Comes Under Control*

Machines we made, methods we developed, have contributed extensively to

the principle of mass production. Working with your accountants, we can make sure your plants are equipped with the newest, most modern devices for assembling and transcribing the facts of costs. Supplementing your supervisory staff, we can develop a plan of work scheduling to establish both time and volume checks. Consulting with your engineers, we can speed up and bring security to research projects.

#### *Mastering Inventory Turnover*

Large organizations have very generally turned to Remington Rand for the new ways of controlling an investment in fixed property, raw materials or finished goods. We can literally predict the turnover rate to be accomplished in these classifications, setting up reliable guides to replenishment, preventing the expensive tendency to overstock, lowering handling costs, avoiding a high percentage of losses from obsolescence and spoilage, reducing storage space.



MANUFACTURERS RECORD



### ***The New Science of Employee Relations***

We recognize that public acceptance of materials or services is often based upon the economics of volume production. We accept as true that governmental regulations and sound labor policies require that decisions nowadays be adequately backed by recorded facts. Our methods of personnel and payroll recording are far more than the establishment of case "histories." They become important factors in employee direction and morale.

### ***Producing and Guarding Business Papers***

Remington built the first practical typewriter, the first Noiseless transcribing machine, so necessary now when office tension is set in high and every disturbing influence must be rooted out. We are pioneers in the photographic copying of business records. Many of our housings are insulated against fire, to provide certified protection for records right at the point where they are used. These are things your firm should know about.



### ***Bringing Precision to the Sales Process***

It isn't enough to know how much is sold. What lines have been purchased? When were they ordered? Where were they shipped? When will they be needed again? In many respects, with the help of Remington Rand machines, typewriters and visible files, the distribution process is taking on the fine precision of production. Marketing costs are lowered. Coverage comes under control. Advertising and promotional expenditures are better directed. Customer service is vastly improved.



### ***Credit Assumes Less Risk***

The credit granting machinery of six years ago is obsolete. Conditions have made it so. More people buy on credit than formerly. There is greater need to avoid delinquency. Remington Rand machines, typewriters and systems are geared to the times. They are quickening accounts receivable turnover for every type of business. They have so speeded the authorization process that selling costs are lowered, selling time is saved, customer goodwill is strengthened.

### ***Figure Facts Have New Values***

Here enters a new appreciation of timeliness. Remington Rand accounting, calculating and tabulating machines and methods bring reports to your desk while the facts are live and fresh. You can act before trends grow serious, before loss becomes inevitable. New ways of producing and transcribing figures have brought new ways of using them. And now they reach you better arranged, better adapted to the specialized needs of your organization, better indicative of the actions you must take.



### ***A Broad Business Service***

This brief summary of services Remington Rand can render is your invitation to avail yourself of their benefits. Our organization probably parallels yours. Any branch or plant your company operates is near a branch or plant of Remington Rand. There you and your associates will find well trained business specialists, fully capable of supplementing the skill of your organization with broad record knowledge and experience. Just write or call the nearest branch of Remington Rand, and our best brains will focus in your behalf.

Manufacturers of  
Adding, Bookkeeping  
and Tabulating Machines,  
Standard, Noiseless and  
Portable Typewriters  
and Supplies

# **Remington Rand Inc.**

BUFFALO, NEW YORK

Visible, Vertical, Loose  
Leaf and Photographic  
Record Systems, Library,  
Bank and Office Furniture,  
Record Protection  
Equipment

# missing link



A brilliantly conceived advertising and selling operation may be lacking in some vital particular and produce only indifferent results.

\$\$\$ Study your program and ask yourself whether there is an important "missing link." It will pay you to find it.

\$\$\$ If your advertising is aimed at high executives, you may be

using publications which they read at home. But do you *merchandise* that advertising by taking space in the medium which they read in their offices—your *point of sale*?

\$\$\$ Much of the selling punch in your copy can be lost in the carry-over from home to office.

\$\$\$ The one and only national publication for management executives that *prevents this loss* is The Wall Street Journal. 86 per cent of its subscribers read it in their offices at their desks.

\$\$\$ It gives you, per advertising dollar, more readers who are active management-executives of industrial corporations with assets of over \$1,000,000 than any other publication.

\$\$\$ Make your campaign more productive by completing it with The Wall Street Journal.

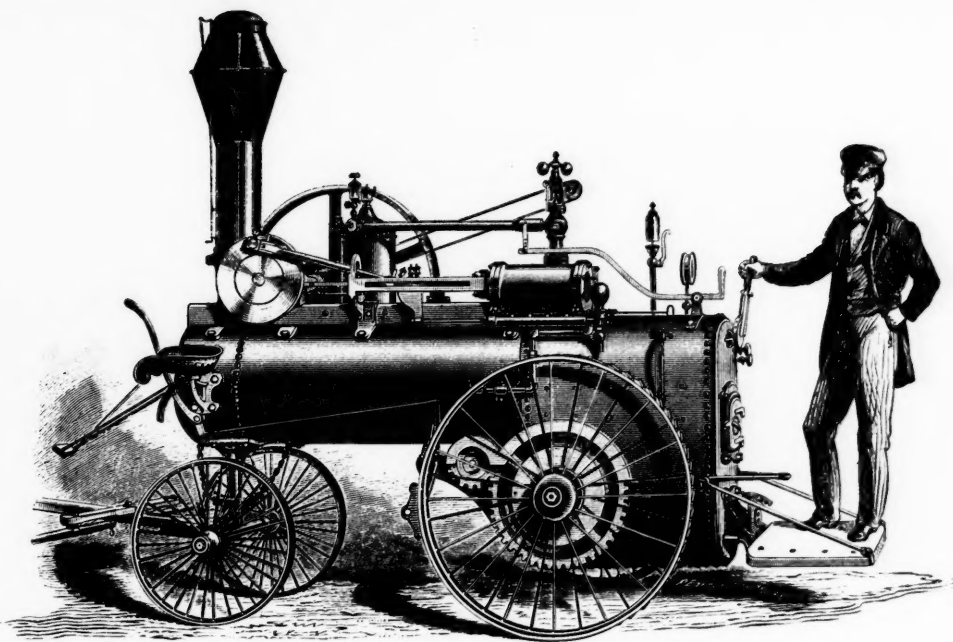
**WALL  
STREET  
JOURNAL**



**SELLS** MANAGEMENT EXECUTIVES

at **point of sale**





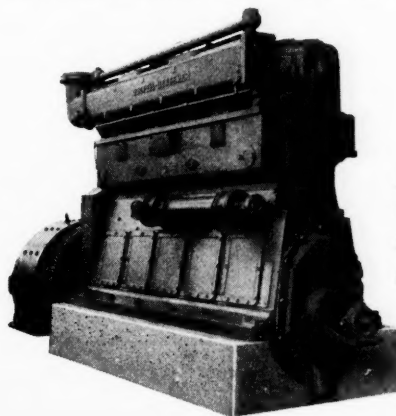
## ...and the Gentlemen from Georgia Doubted!

**N**OVEMBER 13, 1880 . . . the "Daily Chronicle and Constitutionalist" of Augusta, Georgia, carries an editorial written by a prominent citizen . . .

"A novel spectacle was seen on the Petersburg Road last Saturday. To some people along the wayside, while they may have read of such a thing, their eyes had never beheld the reality. To such people, 'seeing was believing' . . . familiar as they are with the Petersburg Road, its roughness, its steep hills, its deep ravines, abrupt curves, massive boulders, and deep holes; its thousand-and-one breakdowns, smash-ups, stallings, capsizings, and cuss words by the wholesale. They had 'hearn talk about such a thing' as an engine pushing itself along, 'but didn't believe a d--n word of it.' They were doubting Thomases . . . until, with their own eyes, they saw the monster 'like a thing of life' travelling this road, over its hills, across its bridges, through its quagmires and streams. They said, 'It was bought in Augusta . . . and here it is!'"

That traction engine, was C. and G. Cooper Company's all-purpose power unit of 1880!

Then, the Cooper Company was 47 years old . . . Today, with 107 years of engine building experience, we still serve the South! Driving locomotives, powering oil field machinery, propelling ships, refrigerating, ginning . . . wherever power is needed, there you will find Cooper-Bessemer gas and Diesel engines.



1940 . . . a modern  
Cooper-Bessemer  
Diesel engine  
generating unit.

### THE COOPER-BESSEMER CORPORATION

Mount Vernon, Ohio — P L A N T S — Grove City, Penna.

25 West 43rd St., New York City	640 East 61st St., Los Angeles, Calif.	631 Spring St., Shreveport, La.
Investment Bldg., Washington, D. C.	201 East 1st St., Tulsa, Okla.	Magnolia Building, Dallas, Texas
529 M & M Building, Houston, Texas	Calmes Engineering Co., New Orleans, La.	1501 Arcade Building, St. Louis, Mo.

# Anyone interested in the future of the South . . .

knows this map from his own first-hand experience.



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# THE WHYS OF THIS VOLUME

It happened in 1937. We were talking to an executive of a large corporation that contemplated the establishment of a new plant "somewhere in the South." Being relatively unfamiliar with the territory as to location of materials and facilities necessary for the operation of their factory, this man wrote to several southern states for information. For days thereafter he was deluged with a mass of printed and other material that was put aside for scrutiny later. However, it was not long before the data was piled feet high. Right there was when we met him. He said "How on earth do they expect me to find time to wade through that?. Besides, while much of it is of the general variety that might appeal to a tourist, an equally large amount is so detailed and technical it is similarly useless—details I leave to our technical advisors." The net result of that experience we discovered six months later was that the corporation had indefinitely postponed the idea of a new factory.

One factory lost for the South, we pondered: how many times had this experience already been repeated and how many more times would it happen in the future? This was a challenge that the MANUFACTURERS RECORD, with its information and experience, could

not ignore. Such occurrences definitely must be reduced if not entirely stopped. But how to do it was another matter.

The one thing most obviously needed was a factual, graphic statement succinctly presented yet thoroughly reliable. It must embody all the essential points an executive might be expected to require in order to ascertain quickly which state fully or most nearly fulfills his company's needs. That was the primary purpose for which were designed the resulting maps and articles covering each southern state published alphabetically in successive issues of the MANUFACTURERS RECORD between May 1938 and September 1939 inclusive. However, their usefulness and value in other directions subsequently has been obvious.

The reception accorded this material by individuals, organizations, business firms and Federal and states' governments, was to make virtually mandatory the further publication of the maps with certain revisions, combined with comprehensive articles explaining in greater detail the resources of each state, as well as the use that has been made of these resources and the opportunities they present for further development. This volume is the result.

## ACKNOWLEDGEMENT

In compiling and editing this volume, and particularly the maps and their accompanying articles, the MANUFACTURERS RECORD has received valuable assistance from a large number of individuals and organizations.

To all of these the MANUFACTURERS RECORD extends most grateful acknowledgement and particularly to the authors of the individually signed articles and to the following:

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U. S. Department of Agriculture, Washington, D. C.

U. S. Department of Commerce, Washington, D. C.

Civil Aeronautics Authority, Washington, D. C.



# THE SOUTH—ITS ABUNDANT RESOURCES

## FOR DEVELOPMENT AND NATIONAL DEFENSE

**T**HIS edition of the **MANUFACTURERS RECORD**, describing the natural resources of the Southern states, is published when the nations of Europe are gripped in a death struggle and the shadow of war extends to our own boundaries.

The purpose originally was to give an accurate and complete account of the South's natural resources and their availability for industrial development. It now will serve the vitally important purpose of showing the essential materials available for national defense.

The data contained in these pages, pertaining to the raw materials of the South, presents facts not before published, and accompanying these are colored maps of each Southern state indexed to show the location of these materials and their accessibility.

This section has been unwisely characterized as the economic problem No. 1 of the nation. Quite the opposite is true. The South presents the nation's greatest opportunity for industrial development. It is the nation's storehouse of raw materials in such quantity and variety for the increase and development of America's wealth as are found nowhere else. They are abundant and accessible. Other conditions of power, of transportation and of labor make certain the value of the opportunity which is presented manufacturers and investors.

The facts appearing in this volume have been brought together through extended research in publications and files of federal government, cities and states. Libraries and universities have been consulted and authorities in various lines called upon to produce information necessary to make complete the account of the South's resources.

War has not come to the United States, but it is a threatening possibility. The development of private enterprise is essential if we are to produce the things necessary for defense, and upon the success of private enterprise depends the payment of the huge government debt.

Industry recognizes the opportunity existing in this region where bountiful nature has placed the necessary materials for its success in such proximity and abundance as are found in no other similar area. Industrial enterprise has been coming South in increasing degree, and now in this section there are many plants not only the largest in the country, but the largest in the world in their respective lines. A list of these is available in the *Blue Book of Southern Progress* issued by this office.

In cotton manufacturing, the South manufactures more than 80 per cent of the cotton consumed in United States mills. In rayon production, with half the mills of the country, it produces more than 70 per cent of the coun-

try's output. Chemical manufacturers see here conditions that will make this section the center of the country's chemical manufacturing, and this is proven by the giant chemical plants located in all parts of the South today, with others projected in increasing numbers.

### Resources and Ability to Produce

Dr. Henry G. Knight, Chief of the Bureau of Agricultural Chemistry and Engineering, United States Department of Agriculture, says in his article on another page: "My guess is that chemistry is going to affect the future of the South a great deal more than it has in the past. \* \* \* The South has the resources and the raw materials waiting to be developed, and the ability to produce more if needed. \* \* \* Chemists have already demonstrated to the satisfaction of financiers and others that they can turn Southern crops and products into profitable industrial outlets."

The South has cheap power and a network of transportation facilities ample for all requirements. It has intelligent labor, besides an equable climate which permits year 'round outdoor work without hindrance by weather. It is well to emphasize here the fact that in this territory American labor predominates to an unusual degree. The South's population has only 7.8 per cent of foreign stock, and the words "foreign stock" are used when the individual or one or both parents have been born abroad. The remaining 92.2 per cent American stock has caused the Southern states frequently to be termed by writers and speakers of other sections "the outstanding bulwark of Americanism." This becomes of added importance at a time when it is essential to safeguard production from sabotage and fifth column movements.

There are brought together in this volume articles by outstanding authorities in various lines who dwell upon the development of the South that has taken place, and the vast field for future development. The reader must inescapably conclude that this development in spite of what has gone on in recent years, and there has been tremendous development, is in its infancy.

### Of Service to the Nation

Robert Strickland, President of the Trust Company of Georgia, in his article says: "In the face of the international situation and all it implies to the United States, we must now consider the South's achievements and potentialities only in the light of her possible service to the nation."

In the present emergency the South, fortunately, can

supply many of the raw materials needed for national defense. It has them in abundance and in locations where power, labor and other conditions make for rapid and economical processing.

With an area in square miles of one-third the area of the United States, and a water area virtually 50 per cent of the entire water area of the country, the South's population is approximately one-third that of the country.

Agriculture here is no longer the principal producer of wealth and it has not been for many years. Manufacturing exceeds the value of all agriculture by more than 260 per cent.

The total cash farm income, including government payments, comprises less than 63 per cent of the value added by manufacture.

In the two years from 1935 to 1937, the dollar value of manufactured products in the South increased 35 per cent, reaching in the latter year a figure of over \$11,500,000,000. Incidentally, but importantly, this total was only 3 per cent below 1929, while the rest of the country made a showing 14 per cent below. In the same two years, 1935 to 1937, the South made a notable increase in the number of plants compared with a sharp decline in the balance of the United States.

Of pig iron, hot rolled iron and steel, structural and ornamental iron, the South produces 17 to 20 per cent of the output of the country.

There are three times as many active spindles in Southern cotton mills as there are in the rest of the United States, and the product of these mills in dollar value, approaching the billion dollar mark, is virtually three times what it is in the rest of the country.

The predominating position the South holds in the country's production of certain vital materials is indicated by the following figures. Of these materials the South produces the following percentages of the country's total:

Naval stores .....	100 per cent
Sulphur .....	100 per cent
Carbon black from natural gas with the exception of two plants outside of the South .....	100 per cent
Bituminous coal, nearly .....	50 per cent
Natural gas, nearly .....	60 per cent
Crude petroleum, over .....	60 per cent
Bauxite, from which comes aluminum .....	100 per cent
Fuller's earth, over .....	75 per cent
Phosphate rock .....	100 per cent
Clay, nearly .....	50 per cent
Feldspar, nearly .....	50 per cent
Mica, over .....	65 per cent

#### To Maintain Long-Lived and Diversified Industries

In the article, "Minerals and Mining in the South" in this number, the author, Paul M. Tyler, Chief Engineer, Nonmetal Economics Division, Bureau of Mines, U. S. Department of the Interior, says: "The minerals abundant

in the South are those needed to develop and maintain long-lived and diversified industries upon which may be founded a well-balanced, prosperous economy. \* \* \* Large sectors of the chemical industry of today did not exist even a decade ago. Instead of merely furnishing fertilizers and industrial chemicals, the process industries of today supply such varied raw materials for industry as textile fibers, plastics, synthetic rubber, artificial leather, felt and other commodities that are better and not infrequently even cheaper than competitive products. It is no mere coincidence that pioneer plants for producing so many of these new materials have been established in the South which not only has the necessary minerals, but also has them in strategic situations with respect to other advantages. \* \* \* While the total value of the mineral output of the United States was a little less in 1937 than it was in 1929, the total for the South alone increased. \* \* \* The region produces virtually all the sulphur and bauxite mined in the United States, and leads in the production of clay, feldspar, mica, bromine and a variety of products."

The author calls attention to a paper read at the 1940 meeting of the American Institute of Mining and Metallurgical Engineers by Hewitt Wilson of the Bureau of Mines, in which the opportunity was pointed out "that instead of shipping only 2½ million dollars worth of raw materials—prepared china clay, ball clay, feldspar, flint and pyrophyllite—the South might produce a large part of its per capita share (in other words one-third) of the national output of 40 million to 100 million dollars worth of pottery a year."

There are other opportunities for profitable industry pointed out in this highly illuminating article, as in other articles in this issue.

The dollar value of the mineral output of the South is 37.9 per cent of the value of the total output of the United States. This value of the mineral production of the Southern states represents an increase of nearly 400 per cent from 1910 to 1936, compared with only 40 per cent increase for the rest of the country. Since 1936 the South has made a further gain of more than 20 per cent, compared with a 15 per cent gain for the rest of the country.

Another example of progress is shown by the Southern fertilizer industry which in 1935 had a production value of \$97,365,000, and in 1937, two years later, a valuation of \$134,669,488, a gain of 38 per cent. Compared with the figures of the total output of the United States, \$195,759,025, it is seen that the South produces more than 68 per cent of the fertilizer output of the country.

The state articles printed in this issue go into greater detail about the advantages and resources of each state of the South, as well as the progress that is being made. Read in conjunction with the indexed maps giving the location of the natural resources by counties, these articles show what use has been made of the wealth bestowed in forest and mine and soil, and the further opportunities that await development. The invitation that is extended to industry is impressive, based upon a foundation of facts that will bear the closest examination.

#### Manufacture and Agriculture Interdependent

The South is industrially-minded. It knows that a man-

ufacturing economy is necessary to an agricultural economy. They are inter-dependent. This section offers exceptional opportunities for decentralized industry, and what is important just now, in a safe location.

As one reads of the new wealth that is being created here by the genius of the industrialist, of the great strides that have been made through modern manufacturing in the utilization of raw materials—and all of this in an area where in the not distant past more attention was given agriculture than manufacturing—an unmistakable trend is clearly apparent. The South is the logical, natural workshop of the nation, and in the development of its resources lies our greatest economic opportunity.

Chemurgy is showing the farmer the way to increase his crops, and to grow crops with a chemical content the

factory needs; thus the industrial chemist finds an inviting opportunity.

Read again the figures of the South's mineral ascendancy, and couple that with its metal manufacturing output.

It is usual for those who are not informed to think of Florida as a tourist land of sunshine and citrus fruit, but in Florida the total value of manufactured products in 1937 was \$217,000,000, while the value of all its agricultural products, including livestock, dairy products and poultry, was \$139,343,000. Another example, Alabama increased the value of its manufactured products from \$357,000,000 in 1935 to \$573,000,000 in 1937, or an increase of more than 60.5 per cent.

Kentucky, land of the Blue Grass, has a mineral output of coal, fire clay, rock asphalt and fluorspar, besides other minerals, that was valued in 1933 at \$65,000,000. Four years later it reached a total of \$127,500,000.

Space will not permit more than a few such illustrations.

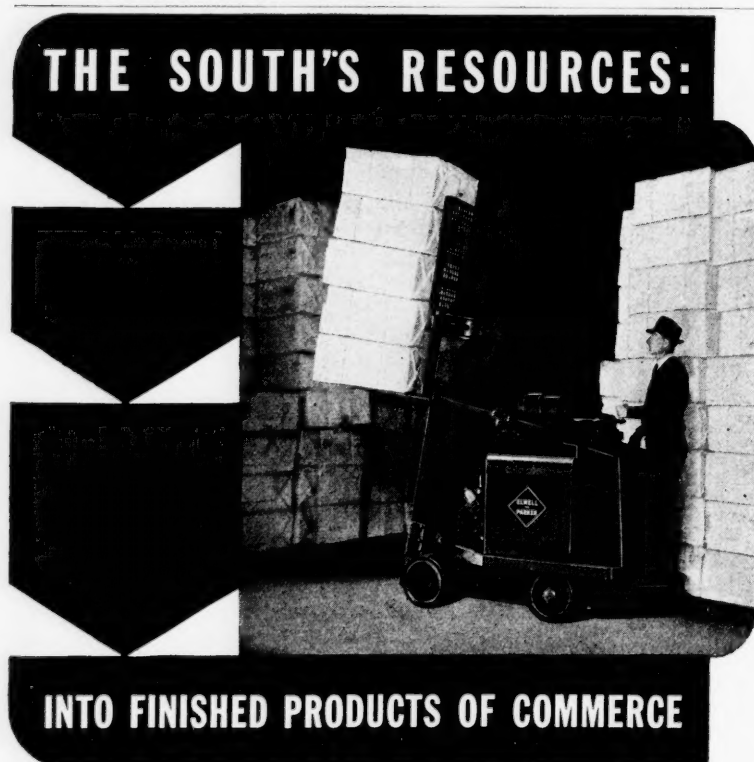
#### Industry the Hope of America

It is impossible for those who realize that the hope of America rests upon industry to read of the phenomenal growth of the South in recent years, and not be thrilled by the story which tells of a new creation, a new life, in the economy and welfare of the nation.

Everywhere the throb of enterprise is increasing, and the reason is clear. The South has the advantages. Its labor, as previously stated, is largely American labor and that means comparative freedom from labor troubles so prevalent in congested areas of the North and East. It has the climate, it has the soil, to make for success and ideal conditions of life. Modern cities, modern hotels, even in small communities, and the latest and best type of highways are contributing factors not to be overlooked.

The temptation to write at greater length on what is revealed in this volume must be put aside. The facts contained in the pages that follow will serve the student and the industrialist for reference in the increasing search for information regarding an empire in the making; the most promising frontier for private enterprise in America.

We hope that what has here been said may serve as an inducement to careful reading of the articles and examination of the maps that contain such a vast fund of vital information.



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# ACHIEVEMENTS AND POTENTIALITIES

THESE are not times when we can sit back serenely and review past achievements with detachment. The season is not right for any such indulgence of individual, section or national self-esteem. Least of all can we of the South choose the present as an occasion to preen ourselves on past accomplishments, even if we are so inclined and no matter how well the facts may justify our pride.

Even as these thoughts are being set down, the headlines and the air waves are proclaiming a story which would have been past belief a few short months ago: France is beseeching Germany for an honorable peace.

In the face of the international situation and all it implies to the United States we must now consider the South's achievements and potentialities only in the light of her possible service to the nation. It would be selfish as well as unpatriotic to speak in broad terms of any section of our country today without dovetailing the facts into our national emergency. And even then, we must take it for granted that there will be certain nationwide revisions of general policy and attitude before a thorough job of preparedness can be done. That phase is a matter which only time can work out—in combination with an increased awareness of the emergency and the measure of our country's willingness to sacrifice both money and leisure.

The South, however, is in better condition to do its part than it has ever been in history.

And that readiness by no means is confined to our agricultural resources, which themselves have attained new proportions because of close recent attention to soil conservation, crop diversification and other applications of a more scientific and farsighted attitude toward the productivity of our soil.

It is in financial and industrial abilities that our region has demonstrated its most useful fitness. The South no longer has natural resources alone to offer. It also has capability and capacity. The South is no longer simply a vast reservoir of man-power, climatic advantage and raw materials; the South has demonstrated also its ability to finance and to organize, to produce, to direct and to energize. The South is no longer a passive tool for the hands of others; it is now an efficient, integrated machine manned by its own skilled operators.

Proof of this partially lies in the fact that industrial and financial activity in the South is fast retarding the regular migration of its youth to more industrialized centers. And, as we continue to grow through industrial expansion, the need for youthful courage and energy will increase. Thus, the South will more and more capitalize upon its native intellectual faculties.

Given the freedom and flexibility which full answer to the emergency's demands is going to exact, the South can

*of the South to be Considered*

*only in the light of her Possible*

*Service to the Nation*

BY

Robert Strickland

President, Trust Company of Georgia,  
Atlanta, Ga.

consider the world crisis almost made to order as a means of obliterating forever the imaginary borders between it and the rest of the nation. The current emergency can well develop into our silver lining to the war cloud, an opportunity which is also an obligation to demonstrate our essential strength, as well as our patriotic interest, in the national unity.

To accomplish the greatest good, we in the South believe if laws, which unintentionally destroy individual initiative and ambition, are modified, then and then only can we exert our energy to the fullest in an emergency and in normal times.

Seven years ago the South was on the verge of incredible growth through industrial activity; and in spite of a badly administered Wage and Hour Law, interference by Northern labor leaders who lacked vision, and other obstacles, the South has performed an incomparable job in getting her share of expanding enterprise.

Facts and figures show that the financial and industrial growth of the South within the past ten years has been far more rapid than that of other sections—even over and above any contributions made to construction and other activity by the distribution of federal funds. (This edition of the MANUFACTURERS' RECORD is designed to present that factual picture; to present less complete statistics would be both presumptuous and repetitious.) And the spirit which has brought about that improvement has really just begun to move in earnest.

The story of the industrial development of the South has

not been one of financial promotion; rather is it a story of close cooperation between banks of the South and small units of various industries. This type of financing would be inadequate for the rapid industrial development ahead of the South, but, supplemented by invested capital of other sections, and directed by Southern enterprise, with Southern labor, it promises to be entirely sufficient. Commercial banking resources of the South are today at their highest figure. Its bankers are as alert and aggressive as those of any other section and doubtless more cooperative with new industries than smaller institutions in older and better developed sections of the country. This combination of resources and willingness offers much for the establishment of new enterprise in the South.

In the seventy-five years which have ensued since the South found itself penniless at the close of the Civil War, there has been a steady movement in this direction of industries from other sections of the country; however, its progress in this period may be attributed in a large measure to thrift and prudent management of the Southern people—attributes not customarily ascribed to them.

The South, like the rest of the country, has looked to the large financial centers for its investment banking facilities due to inadequate Southern capital; particularly has this been true in recent years, in view of restrictive legislation. However, the South today has more capital than at any time in its history, having increased proportionately far greater than in any other section of the Nation.

It is obvious, of course, that the South is not as rich in capital as some other sections. But the sort of investment and encouragement which already has built big enterprises throughout the South from small beginnings are still active, because they are part and parcel of the spirit of the southern people themselves—a spirit that believes that what you get out of life and business is pretty much measured by what you put into it. The story of success that has so often been re-

peated in the South, in which a small enterprise—in cotton textile and other fields—has grown to considerable proportions with the help of local capital and local banking institutions, is capable of still further development. During the period of emergency, brief or long-drawn-out, this proven team of southern enterprise and southern banking can still do a job—for preparedness as well as for private profit.

The South's awakening to its possibilities in other fields cannot fail to find a place in our future—peaceful or military in design. Paper and pulp manufacture, already under way, is only one phase of cellulose conversion open to the section. Farm chemistry, or, to use a fancier title, chemurgy, is in its infancy—but a vigorous infancy with possibilities that far outstrip anything that happened in the *ersatz* phases of Hitler's Germany. Experiments have proven the practicability of making rubber from petroleum—a step toward independence from the foreign-held rubber plantations and those in danger of a new colonial set-up among European powers. And, to release the petroleum for new needs—experiments with vegetable alcohol as a supplementary motor fuel have passed far beyond the stage of visions. These are but random examples chosen from a multitude which seem to indicate that the job of complete preparedness not only can *not* be done without full assistance from the South; but also that there is much of it that can *only* be done by the new vitality and flexible resources which now have reached their fullest expression in the South.

When the word *go* is sounded, the South will be ready—readier than ever before when the region has answered the challenge of a national emergency. The signal—that one word *go*—will have also to encompass removal of many restrictions which now hamper full production, of course. But that is a concession the whole industrial nation must have if the job is to be done—still leaving the way open in the South for undoubted leadership in any comprehensive program laid down for the United States to follow.

#### BANKING IN THE SOUTH

(Includes all Banks Reporting to the Comptroller of the Currency, June 30, 1939.  
National, State, Savings and Private Banks)

State	Number of Banks	Aggregate Resources	* Capital Stock	† Individual Deposits	§ Southern Bank Clearings Calendar Yr. 1939
Alabama .....	216	\$ 348,873,000	\$ 28,465,000	\$ 298,371,000	\$ 1,200,149,000
Arkansas .....	216	202,743,000	13,652,000	176,548,000	461,573,000
Dist. of Col. ....	22	372,713,000	19,723,000	323,681,000	1,190,641,000
Florida .....	170	438,107,000	22,845,000	393,332,000	1,318,847,000
Georgia .....	284	519,707,000	33,325,000	451,340,000	3,117,045,000
Kentucky .....	414	544,576,000	36,957,000	463,806,000	1,853,086,000
Louisiana .....	146	559,147,000	25,728,000	504,805,000	2,187,369,000
Maryland .....	190	1,003,744,000	37,231,000	894,197,000	3,544,529,000
Mississippi .....	205	220,050,000	16,293,000	191,825,000	237,931,000
Missouri .....	636	1,678,359,000	86,361,000	1,501,360,000	9,286,322,000
North Carolina ..	228	490,804,000	25,637,000	431,626,000	1,144,453,000
Oklahoma .....	396	516,548,000	28,580,000	458,921,000	696,509,000
South Carolina ..	151	157,944,000	9,460,000	139,666,000	230,018,000
Tennessee .....	299	589,420,000	36,790,000	520,288,000	2,171,823,000
Texas .....	844	1,661,158,000	97,142,000	1,471,897,000	6,881,980,000
Virginia .....	315	687,181,000	44,871,000	596,115,000	2,502,043,000
West Virginia ..	181	341,803,000	26,649,000	289,667,000	2,269,260,000
<b>SOUTH .....</b>	<b>4,913</b>	<b>\$10,332,877,000</b>	<b>\$589,709,000</b>	<b>\$9,107,445,000</b>	<b>\$38,293,578,000</b>

\* Includes capital notes and debentures.

† Demand and time deposits.

§ Amounts shown are not the total bank transactions, but comparable totals of clearing house exchanges in 73 southern cities out of 280 reporting exchanges in the United States.

Aggregate resources of southern banks in 1939 increased more than \$850,000,000 over 1938 while the 1938 figure represented an increase of \$46,000,000 at a time when the rest of the country showed a decline of \$639,000,000.

# THE HARDWOODS OF THE SOUTH —

BY

Captain I. F. Eldredge,  
Regional Director, Forest Survey,  
United States Forest Service,  
Southern Forest Experiment Station

## *An Opportunity for Greater*

## *Industrial Development*

**I**N the economic growth of the South, there is no more significant factor than the proper development and full use of its natural resources. These natural assets may be put into two broad classes—in one, those like oil, coal, iron, and other minerals, of which we have a certain fixed quantity to draw upon; and, in the other, those that grow from the soil, utilizing the sunshine, the rains, and the rich warm earth to reproduce themselves—resources that if protected and fostered may be used in undiminished quantity by this and all the generations to follow.

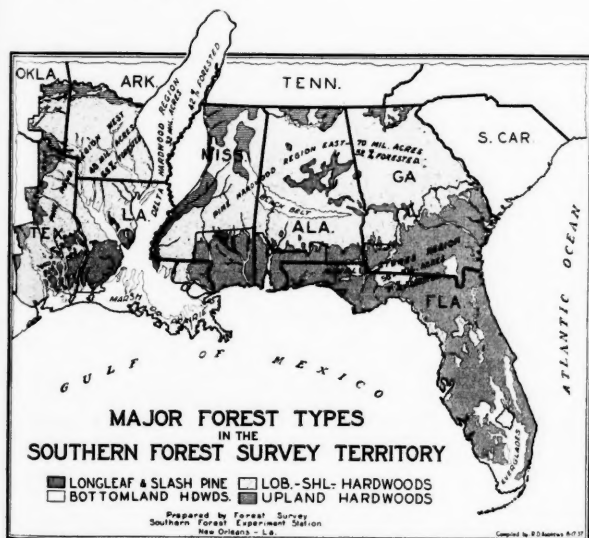
The forests of the South fall into this second class, and since they occupy nearly 60 percent of the land area in the region, they present one of the most tangible and promising items in its inventory of resources with which to build for the future. Notwithstanding the heavy overdraft made against them in the South's long struggle to recapture the economic standing it lost in the Civil War, the timber lands of the region today support an industrial structure of no mean proportions. In 1937, in the eight states or portions of states lying between the Savannah River and the plains of Texas, the Forest Survey of the U. S. Forest Service found over 10,000 industrial forest-products plants actively in operation, employing men, machines, facilities, and capital, and producing a quantity and variety of goods that puts the group high in the upper brackets of the South's industries.

material amounting to nearly 1½ billion cords of wood, in which there was a volume of the quality to produce lumber amounting to 255 billion board feet. This stock of timber was growing at the rate of 63 million cords per annum. After deducting the entire drain, of which 16 million cords were lost owing to mortality, and 41 million cords were material cut for industrial and domestic uses, there was added to the original growing stock as the surplus of growth over drain for the year nearly 6 million cords.

On the face of it, this favorable balance of growth over drain would appear to relieve any fear we might have as to the capacity of Southern forests to meet our present requirements. An analysis of the data, however, discloses that the situation is neither as simple nor as favorable as this statement of the budget would have it. In the first place, the lumping together of statistics of stand, growth, and drain, for such a large area, is misleading, in that it tends to cover up local conditions where an unfavorable or even alarming supply situation exists. While deficiencies in one section may be offset by substantial surpluses elsewhere, this does not relieve the stringency so far as the less fortunate localities are concerned.

In the second place, because a large part of the volume and growth is in second-growth stands in which small trees predominate, the growth situation in relation to the drain is much less favorable as regards the saw-timber component of the stand than it is for the entire growing stock. In 1937, for instance, it is true that the growth of the total growing stock, including all sound trees 5 inches d. b. h. and larger, exceeded the drain against it in 6 of the 7 states in the lower South; but that same year the saw-timber growth exceeded saw-timber drain in only two states, Texas and Georgia. In other words, in five of the seven states, the saw-timber material was being cut faster than it was being replaced by growth.

Another phase of the current situation comes to light when one breaks down the statistics and considers separately the two broad species-groups, pines and hardwoods. In such an analysis, it appears, as shown in figure 2, that for the lower South as a whole, the drain of pine from all sources (industrial and domestic use, 26½ million cords; mortality, 8 million cords), very nearly approached the total pine increment (35 million cords), there being a current surplus of only half a million cords. The figure for hardwoods, on the other hand, shows that the hardwoods are being utilized less intensively than the

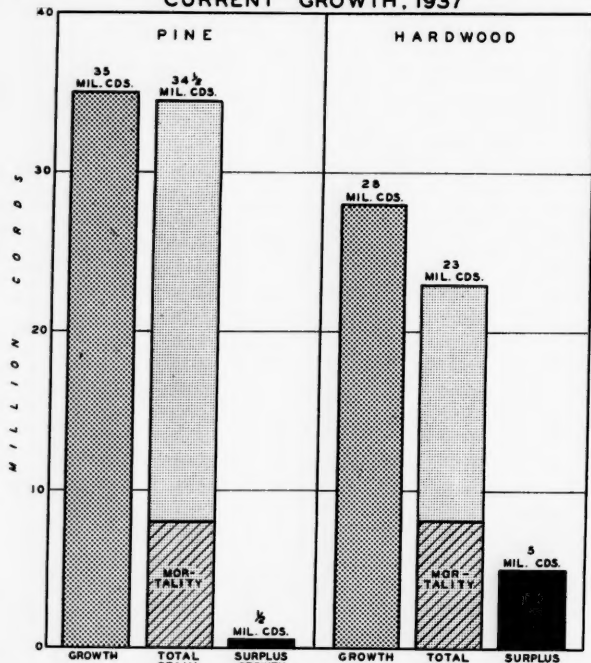


In the inventory of the forest resources of the Lower South, the Forest Survey found 122 million acres of commercial forest land, upon which there was standing a total volume of usable



pin. Of a total growth of 28 million cords in 1937, 15 million cords were used and 8 million cords were consumed by fire, rot, insects, and natural crowding, leaving over 5 million cords as a surplus to be added as the year's accretion to the growing stock.

FIG. 2 - COMPARISON OF TOTAL DRAIN WITH CURRENT GROWTH, 1937



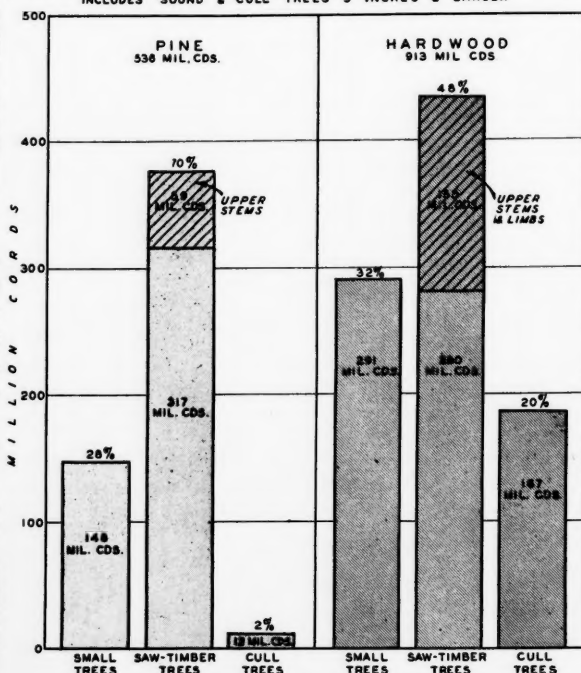
Consideration of this unequal use in the two broad species-groups leads very logically to the thought that the situation might be improved if some of the drain against our pine forests were shifted to the hardwoods. In developing this thought, let us examine the Survey's figures. It was found that hardwoods, either in pure stands, or mixed in varying degrees

From the pine forests of the South is taken annually more than 25 million cords for industrial use.



with the pines, occupy 51 percent of the entire forest area of 122 million acres in the Lower South. This distribution of hardwoods occurs, to a greater or less degree, throughout all of the four major forest regions into which the Lower South is divided. The volume of usable material in the hardwood species, in all trees 5 inches d. b. h. and larger (including cull trees), makes up 63 percent of the total usable volume of nearly 1 1/2 billion cords in the region (fig. 3). Of the 913 million cords of sound hardwood volume found, 32 percent was in small trees (5 to 13 inches d. b. h.), 48 percent in saw-timber trees (14 inches d. b. h. and larger), and 20 percent in cull trees ordinarily considered not suitable for lumber, veneer, and many other industrial uses. Worthy of note is the fact that of the total of nearly a billion cords of hardwood, about two-thirds, or 633 million cords, were in small trees, cull trees, and the upper stems and limbs of saw-timber trees. As presently constituted, the forest industries that use hardwoods require predominantly high-quality material—material such as goes into high-grade industrial lumber, veneers, cooperage, etc.—and there is little industrial demand for the small, low-grade material that characterizes two-thirds of the hardwood volume.

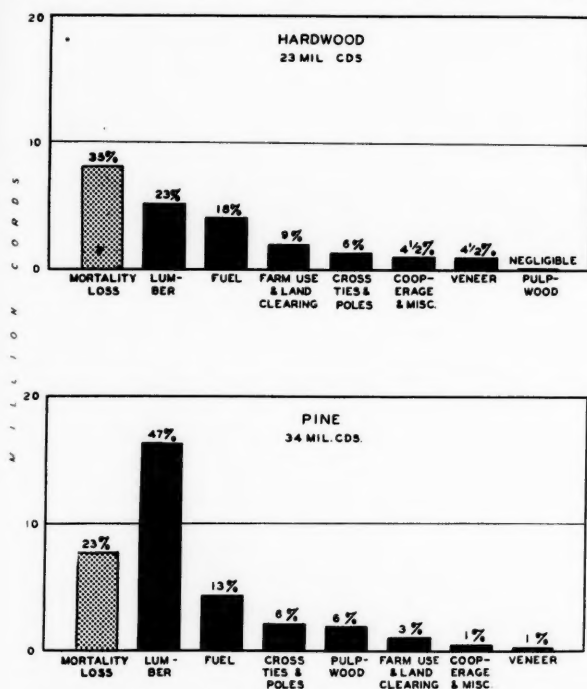
FIG. 3 - TOTAL VOLUME OF USABLE MATERIAL INCLUDES SOUND & CULL TREES 5 INCHES & LARGER



An analysis of the drain figures for 1937 (fig. 4) shows that the greatest source of drain against the hardwood growing stock, amounting to 35 percent of the total of 23 million cords, was the loss due to mortality, a profitless consumption of good material if ever there was one. The largest industrial use was for lumber, 23 percent; fuel, mainly for domestic use, was next with 18 percent; and following in the order named, were farm use and land clearing, 9 percent; cross ties and poles, 6 percent; veneer, 4 1/2 percent; and cooperage and miscellaneous manufacturing, 4 1/2 percent. The volume of hardwood used for pulpwood was almost negligible. Comparing these figures with those in the breakdown of the pine drain, the most striking difference is found in the use of pulpwood; in the pines, the pulp mills in 1937 accounted for 6 percent of the total pine drain. When the mills now under construction are com-

pleted, it is expected that the proportion of pine pulpwood will be materially greater though still relatively small.

FIG. 4 - THE DRAIN AGAINST THE FOREST 1937



In the long run, if they are to remain permanently in business, the forest industries in a community or region cannot continue to use the growing stock faster than it is being replaced through growth. In fact, with the forests of the region in their present relatively depleted condition, somewhat less than the annual net growth should be taken in order that the capital forest asset behind the industries may gradually be increased to something like the full capacity of the forest site, and thus provide for future extension of industry.

As emphasized previously, however, in addition to the material measured by the annual growth, there is available in the forests of the Lower South a tremendous accumulation of sound, usable material in cull trees and in the tops and limbs of saw-timber trees. This amounted, in the case of hardwoods, to 342 million cords at the time of the survey. Its presence in the forests is a hindrance to good silviculture, and its removal would do much to increase growth and improve the stands from which it was taken; the most ardent conservationist could interpose no objection to its speedy liquidation.

The problem is to build up as rapidly as possible a wider industrial use of our hardwoods. The mills producing industrial hardwood lumber, as at present organized, use principally large trees to produce high-grade material, and until they change their requirements to make use of smaller, second-growth trees, as well as trees of certain so-called "inferior" species, it is not likely that the cut of southern hardwood lumber will be increased greatly, or that any part of the large accumulation of material in cull trees and the tops and limbs of saw-timber trees will be disposed of. The veneer and cooperage industries, in large part, require trees of greater than average quality and, in the case of cooperage, at least, are limited to comparatively few of the many hardwood species. The railroad cross-tie industry is a large user of hardwoods, but its market does not promise an outlet for any considerable portion of the surplus accumulation of low-grade material.

Under the existing circumstances, therefore, the possibility of extending materially the use of our southern hardwoods seems to lie in the field of wood conversion, particularly in the industries manufacturing pulp and pulp products. As developed today, the large and growing pulp industry of the Lower South is based almost entirely upon the use of pine. Of the 26 mills now in operation or under construction in this region, only one mill uses hardwood exclusively, although several others are beginning to mix in small percentages of hardwood. It is gratifying to note that there is a growing, practical interest on the part of Southern pulp companies in increasing the proportion of hardwood used in their processes. The knowledge of the technique of pulping hardwoods of the various prevalent species is growing rapidly, and the day is coming when the hardwoods will find a place in this industry on a par with the pines. This will convert into consumer goods much material that now is largely without a market, and at the same time relieve the threat of too heavy a drain against the pines.

Industrial chemists, however, will not consider hardwoods from the paper angle alone; the field of wood conversion is open wide for the development of processes for the production of synthetic boards, plastics, basic chemicals, and perhaps even textiles and foods. In any program designed to bring the South fully into its own, the full development and intensive utilization of its forest resources must play a very important part. In this, our pine forests seem already to be headed in the right direction, but there is a tendency to overlook the potentialities of our hardwoods, which, after all, occupy more than half of our forest area and contain nearly two-thirds of our wood volume.

*Though the South is usually regarded as a pine region, most of the pine forests are heavily intermingled with hardwoods.*



# INDUSTRIAL UTILIZATION OF SOUTHERN FARM CROPS

BY

Dr. Henry G. Knight

*Chief, Bureau of Agricultural Chemistry and Engineering  
United States Department of Agriculture*

**T**WENTY-FIVE years ago the agriculturists of the country were striving to make two blades of grass grow where only one had grown before. Our whole economy was built around a program of increasing the production of farm crops. The cry was for more of practically everything we could produce.

During that period of expanding production the South was accustomed to selling abroad from 8 to 9 million bales of cotton, large quantities of tobacco, fruit, naval stores, and other products of the soil. The surplus problem had not entered the picture at that time. It didn't appear in earnest until around the early twenties but it has been throttling the income of Southern farmers in one way or another ever since. Our exports of Southern farm crops have gradually fallen off until we now have large unwanted stocks of some commodities almost every year. It is said, too, that as a result of reducing diets and slenderizing fads that we are actually eating *less* food today than we did 50 years ago. It has been estimated that the average citizen eats something like 100 pounds less food per year than he did in 1900. On that basis the food demands of the people of the United States have decreased by something like six and a half million tons a year.

Now the question is, what are we going to do with these surpluses? A great many attacks have already been made on them and some of these have been very helpful, but they haven't completely solved the problem. We continue to have surpluses in some crops almost every year unless we practice some method of controlled production. In addition to that we have learned how to increase the production of farm crops to such an extent that we could produce for much larger outlets than for the ordinary ones of food and clothing if larger markets could be found. One of the ways that scientists have suggested for meeting this situation is to turn these crops, particularly the surplus crops, into industrial channels where the outlet is not so limited. We know from experience that the amount of food that can be consumed by the human stomach is limited, and that the opportunity for large expansion in that field is pretty slim. On the other hand, chemists have already found ways in which agriculture, in addition to feeding and clothing the Nation, may be used to supply raw material for industry. The results of a recent study show that from 86 agricultural products come 133 different raw materials now used by industry. These raw materials make 240 different manufactured products which, in turn, have more than 400 uses. So I agree that the best opportunity for new outlets for farm products is in the industrial field.

There has been so much interest in the last few years in the expansion of the markets for farm products through new and wider industrial outlets that Congress made an appropriation in 1938 and authorized the Secretary of Agriculture to establish 4 large regional research laboratories to carry on this work. The Bureau of Agricultural Chemistry and Engineering

is administering these laboratories. One is located in each of the 4 major farm producing areas of the country. The one for the South is located in New Orleans and will serve the States which the MANUFACTURERS RECORD has worked to improve industrially and otherwise for more than 50 years. The New Orleans Laboratory will begin with studies on cotton, sweetpotatoes, and peanuts.

Research is slow. It has to be to be accurate and safe, and it will be some time before we can pass judgment on the results of this new laboratory program. But we can say now without fear of contradiction that there is an abundance of raw material produced on Southern farms which scientists believe could be turned into industrial products. The South is particularly blessed with soil, sunshine, and other climatic factors which plants store up in the form of starch, oils, fats, and fiber. This fortunate arrangement provides the South with a good many starch and fiber crops which are important in the industrial field, and which lend themselves to the various manufacturing processes. Cotton lint, for example, is one of the purest forms of cellulose fiber. The cotton stalk, as well as the hull, also contains considerable cellulose.

There is enough raw material produced on Southern farms in the form of cotton, sweetpotatoes, peanuts, citrus fruits, rice, tobacco, and so on to justify an extensive research program looking toward the industrial utilization of these crops. In addition to these main crops, the South has a great quantity of raw material in the form of byproducts that could also be utilized by industry. A profitable outlet for the byproducts alone would increase the income of Southern farmers millions of dollars a year.

The three main chemical constituents in Southern straw, stalks, hulls, and other agricultural wastes are: cellulose; lignin; and hemicellulose. Approximately 40 percent of our Southern stalks and hulls is cellulose; about 30 percent, lignin; and about 30 percent, hemicellulose. A careful estimate shows that there are something like 18 million tons of stalks in the average cotton crop, about a half million tons in sugarcane bagasse, over a million tons in cottonseed hulls, and over 100 thousand tons in peanut hulls, to say nothing of the byproducts that come from rice, citrus fruits, tobacco, potatoes, and other Southern crops. Let's look for a minute at cellulose. Cellulose when only partially refined can be used in making paper, building board, insulating material, and absorbents. When free of impurities it can be converted into cellulose compounds which are used to make rayon, lacquers, celluloid and other plastics, explosives, transparent wrappings, cellulose sponges, and other products. Cellulose is an inviting field of research that many chemists would like to explore if they had the money and time. Cellulose constitutes a large percentage of the gross tonnage of the material that is removed from the soils of the South in the form of crops and their byproducts of straws and hulls. In other words, Southern farmers are producing millions of tons of cellulose in the stalks and hulls and straws of the crops they produce for the market. They get paid for the crops they market, but they lose on the byproducts because these, with a few exceptions, have not been converted into products that bring cash returns. And that's one of the problems the chemists of the country are called upon to solve.



We are being asked to try to find new and wider uses for the products and byproducts of the farm. That's not an easy task either; but with the cooperation and help of the State Agricultural Experiment Stations, and other interested organizations and individuals, and with the new research laboratories in which we can concentrate on certain crops and problems, we hope to make better progress in the next few years than we have in the past.

But our past achievements should not be minimized because chemistry has already contributed largely to the agricultural and industrial development of the South. The part it has already played has been constructive instead of spectacular. Cotton textile mills, cottonseed oil mills, paper mills, canning plants, and hundreds of agricultural processing plants are monuments to the results of research by chemists and engineers. What the results of research on Southern farm crops will be in the future depends of course on the vision and the resources of the people who are pushing this movement.

In order that we may get a proper picture of this new chemical development idea and of the value of the industrial utilization of farm crops, let's look briefly at some of the things that have already been accomplished in that field and then do a little prophesying as to what may be done. When it comes to accomplishments in the chemical field I, of course, can only speak of what has been done by the organization I represent, namely, the Bureau of Agricultural Chemistry and Engineering of the United States Department of Agriculture. I mention these accomplishments not in a boastful way but merely to illustrate the point. Here are 10 examples of fairly recent accomplishments in that organization. The first is on colors.

The gay, fast colors that men and women are wearing today are largely the result of basic research by chemists of the United States Department of Agriculture. This research developed new technical methods for the economical production of intermediates required for the manufacture of fast and brilliant dyes for cotton. This one piece of research has expanded the cotton market several million dollars a year, as well as providing the public with gayly-colored garments and household fabrics that will not fade.

The new sweetpotato starch plant at Laurel, Mississippi, produced 2,700,000 pounds of starch during the past season. This new enterprise offers farmers an opportunity to add another profitable cash crop to their present farm program. During the past two years farmers around Laurel have made more money from growing starch potatoes than they have from growing cotton on similar land. More than 12 hundred co-operative farmers participated in the benefits of the Laurel plant in 1939.

Citrus growers have benefitted tremendously in the past few years as the result of chemists' investigations. By treating certain varieties of green-colored but completely mature and tree-ripened oranges with ethylene gas the green color is bleached out, leaving the orange a beautiful yellow. This treatment which is now in general use cost the taxpayers about \$4,000 and is estimated to be worth about \$4,000,000 a year to the producers of citrus fruit in Florida alone.

It was said a few years ago that you couldn't produce good cucumber pickles in the South on account of the hot weather. So our cucumber growing was confined largely to production for the fresh vegetable market, until recent research by this Bureau and the North Carolina Experiment Station showed that with a slight modification of the pickling methods used in the North, quality products could also be produced under Southern conditions. It is now possible and practical to pack high-quality fermented cucumber pickles in the South where



*Top—Harvesting rice in Louisiana where, together with Arkansas and Texas, over 90% of the nation's rice is grown and provides a large industry for cleaning and packaging. Center—Bagasse, or waste sugar cane, provides the basis of a large industry making wallboard and similar materials in Louisiana. Bottom—Some of the fine Georgia cattle which are helping to expand the South's cattle market and meat packing industry.*

fermentation requirements are different because of the warmer climate. Thousands of farmers are now benefitting from this new development in North Carolina where the work was started a few years ago. As a direct result of this research North Carolina has become the largest pickle producing State in the South and the fourth largest in the country.

Recently, the Patent Office granted to the Secretary of Agriculture a public service patent on a process that opens up further possibilities for industrial uses of milk, corn and sugar cane. The patent covers an improved method for using the lactic acid which can be made from these three farm products for the preparation of artificial resins. These new resins belong to a class of plastic which is used mainly in paints, lacquers, and varnishes. In fact, resins of this character have pretty well revolutionized the art of painting automobiles. Formerly, the automobile makers had to put a dozen or more coats of paint on a car. But, with these new paints or enamels, they apply one coat, bake it, polish it, and that's all. These resins also can be used in making insulating materials for electric cables, and certain types of lithograph rolls, and may also be good for many other things. Last year the country used about 61 million pounds of resins belonging in this class. A good proportion of the ingredients of these commercial resins consisted of glycerine made from hog lard and other fats.

Sorghum sirup is now a greatly improved and more uniform product as a result of research. A new method developed by chemists uses an extract of barley malt, to prevent scorching and jellying caused by starch, and a yeast extract to control the tendency to crystallize or sugar. This process, which includes the use of improved sirup-making equipment, is being used extensively in Alabama where hundreds of farmers are reaping financial benefits from this new development, as well as helping to supply consumers with a better quality of "molasses."

Chemists have worked out waterproofing and preservative treatments for farm fabrics. The purpose was to devise and improve waterproofing and preservative treatments for cotton fabrics exposed to the weather on farms and elsewhere which would make them more serviceable and thereby extend the uses of cotton. They have also developed methods for lightproofing, mildewproofing, and fireproofing. Some of these methods are now in commercial use.

The producers of gum naval stores—a thirty million dollar crop—are now getting over a million dollars a year, more than they would be receiving under conditions which existed a few years ago, before chemists took the naval stores problem to the laboratory. Research in this field has given the industry a permanent set of standards for grading rosin, estimated to be worth \$150,000 a year to pine tree farmers; developed better barrel gluing and an improved dehydrator for turpentine, estimated to save the industry \$250,000 a year; developed improved still settings worth \$200,000 a year; developed a method for improving the quality of pine gum valued at \$150,000 a year; developed methods for controlling turpentine distillation worth \$100,000 a year; introduced improved turpentine storage conditions valued at \$100,000 a year; developed a new type of steam turpentine still which when used in conjunction with gum cleaning is worth \$2,500 a year to each user; advised producers how to prevent rosin losses in chips resulting in a savings of \$200,000 a year; and proved that gum contaminated with iron rust from rusty equipment can lower the quality of rosin as much as 3 or 4 grades, reducing the income of the producers of gum naval stores around a half million dollars a year.

Soybean growers in some parts of the country during the past processing season suffered considerable loss through dockage at the elevators because of the presence of a high percentage of green beans. They are now assured of relief from such dockage, which has been running from 5 cents to 30 cents a bushel, as a result of studies made at the U. S. Soybean Laboratory. It was found that the retention of the green

color is apparently the result of hot, dry weather in late summer, but that the green beans are of normal composition. They also determined that the green color that went on into the oil when the beans were crushed could be easily removed. These findings brought about a liberalization of the dockage, according to estimates, resulting in a saving of \$1,000,000 to soybean growers in one State alone.

The grapefruit seed is now beginning to contribute its bit to the income of the citrus industry, as a result of recent research. The new product is an oil expressed from the seed, 90,000 pounds of which was turned out last year. The oil, after chemical processing, is used mainly by the textile dyeing industry and is said to be highly effective in promoting penetration and fixation of the old but popular dye known as turkey red.

The wider utilization of Southern farm crops in making and improving the things I have mentioned is adding dollars to the pockets of Southern farmers but the accomplishments thus far are, in my opinion, rather small compared with what we could rightfully expect should we find more and larger industrial outlets for such major crops as cotton, tobacco, potatoes, and peanuts.

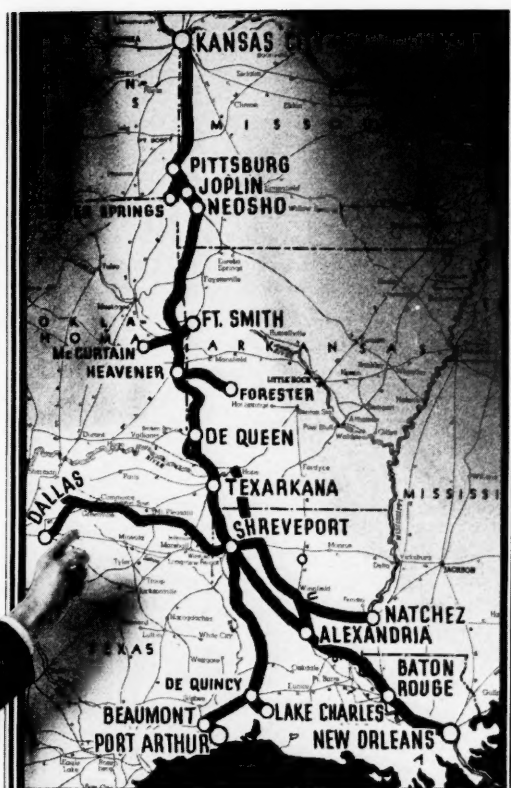
And now that I have mentioned a few accomplishments resulting from chemical research, let's do a little prophesying on what the South needs in the way of chemical research to help solve some of its farm problems. Without going into detail, I think I can safely say that more chemical research is needed in connection with the utilization of wastes and by-products of nearly every Southern crop. Instead of striving to produce more, it seems to me that we should be striving for a more profitable utilization of what we already have. What chemists have done for citrus, naval stores, sweetpotatoes, and cottonseed is just a beginning, compared with the millions of tons of products and byproducts from these and other crops that should be utilized.

Take sweetpotatoes for example. As a result of starch work in Mississippi, we have found that there are about 3 tons of starch in an average acre of potatoes. The day may come when starch will be used for fuel for running automobiles and other engines. This has already been demonstrated on a small scale in our own laboratories. What seems impossible today often becomes a reality tomorrow, especially in times of war and other emergencies, and it is well for us to work out these chemical problems as we can and keep them on record for the future if they happen to be impractical under existing conditions.

My guess is that chemistry is going to affect the future of the South a great deal more than it has in the past. There are two reasons for this statement. In the first place, the South has the resources and the raw materials waiting to be developed, and the ability to produce more if needed. And, in the second place, chemists have already demonstrated to the satisfaction of financiers and others that they can turn Southern crops and products into profitable industrial outlets. I believe that chemical fuels for automobiles, trains, and airplanes will be as common in 40 or 50 years as rayon stockings are today. Where is the raw material for these products coming from? I believe a lot of it will come from the farms and forests of Dixie.

Naturally, we shouldn't expect the chemists and engineers to solve all of our farm problems. We need a well-rounded program for the best results. Producers, processors and consumers must all have a part in this undertaking. Such a program requires cooperation. So we should all pull together for the day when the South will be enjoying new, wider and more profitable industrial outlets for Southern farm crops.

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# LABOR IN THE SOUTH

THE South has an abundance of man-power which is industry's greatest asset. The only necessities are more industries of the type now located in the South, so that there will be greater opportunity to work under intelligent direction. The unfavorable myths that have been attached to southern labor, usually by those who know nothing about southern workers, are being disproved in thousands of factories every working day. One of these myths is that workers in the South are slothful, unambitious and hard to train. This is tommy-rot and nothing could be farther from the truth.

Because the population of the South is highly decentralized (a fact incidentally that is greatly advantageous to industry in most respects) and there are exceedingly few large cities, the average southern industrial community, generally speaking, does not have a "reserve army" of unemployed craftsmen, skilled in modern methods of production. Most of the factories recently established in the South have been located in areas which previously knew no industries whatsoever, while many of the plants represented industries that were not only new to the district but new to the South. Therefore, in establishing a new factory in a southern community, it has often been found necessary to bring in a nucleus of skilled men around whom the working force can be built. In the case of industries that are new to the South, such key men are usually brought from other centers where the given industry has been long established. Then the training program must be pushed forward, and in no case known to the writer has a soundly built program of industrial training failed.

Many industrialists, strangers to the South, have openly expressed their enthusiasm and preference for southern labor. One man of the writer's acquaintance, an industrial mining engineer from the Middle West, who has worked in almost every one of the forty-eight states, says that he would choose southerners to work for him before any others, because they are hard-working, loyal and intelligent. One large chemical company, with several plants in the South, has made it a rule, based on experience, to use men from outside the plant location only long enough to train local people. When this has been done the latter may be safely entrusted with the most technical and highly specialized equipment necessary in the production of chemicals.

The great oil companies brought a few "still-men" to their new refineries in the South, and in short order they developed local workers to a point where they could take over the operation of the stills with utmost competence. A shoe manufacturer entered a southern city that had never had a shoe factory; he "imported" certain experienced factory executives and a small group of key craftsmen, and rapidly supplied the balance of his labor force by training men and women who had previously done nothing with shoes except wear them.

Similar experiences could be cited from the great variety of chemical industries. The large number of pulp and paper mills that have been established in recent years, the electrical goods industry, the iron and steel industry, the glass industry, and a host of others may be used as examples.

Very emphatically there is no difficulty about training factory workers in the South. It has been said that the factory manager in the South has the same problem essentially, as the factory manager in the North, but this is only partially true,

for in the South, as in no other section of the country, he is dealing with native born Americans. With over 97 percent of the white population being native Americans, there are none of the language and cultural differences that are found among immigrants and others in many industrial communities of the North.

If the southern plant work-force is to be efficient, its members must be carefully selected, soundly instructed in their jobs, intelligently supervised, and compensated in such a manner as to evoke their best efforts, just as they would have to be in any other place. Using these policies, hundreds of manufacturing establishments already are operating successfully in the South. But if these principles are not followed, factories will survive only as long as they can procure labor in a glutted market at unreasonably low rates. Inevitably, the days of such factories are definitely numbered, for the firms locating in the South are fully aware of the fallacy of such practices as uneconomic and are as bitterly opposed to them as are the workers.

Another castigation leveled against the South is that of low wages, but as in the case of those who malign labor's ability, this is done either in ignorance or in deliberate confinement to misleading generalities in comparison with more highly industrialized areas. Certainly one cannot convey any accurate idea of wage conditions in any part of the country without giving at least some details. This is particularly true of the South because the labor supply is largely a matter of the utilization of a rural population for industrial purposes.

Coupled with this is another factor. The rural South long has had a relatively high birth rate, and the natural increase of population in country districts, together with a stationery or even a declining demand for farm labor, has made for a steady flow of young persons from country to city. In other words, in the South, industry is drawing for its labor supply upon a population that is approximately 67.5 percent farm and rural whereas in the rest of the country the farm and rural population comprises only about 36 percent. Under such circumstances it is obvious that, taking into account the year 'round warm climate, living expenses are materially lower in the low population density, rural South than they are in the industrial North and East.

Then too, until a comparatively short time ago the traditional industries of the South were of the kind that did not require highly trained craftsmen such as are necessary, for example, in the machine tool industries. Had there been as great a preponderance of similar industries in the North as there were in the South, comparison of wage rates on a general basis would have shown a striking similarity. In the same way, had there been as great a diversity of industries in the South as there was in the North, the average wage rates would again have shown little variation. As a matter of fact, prior to the past decade, wage rates in certain industries in the South were virtually identical with those in the North. Even today, in the so-called traditional industries the difference between wages in the North and those of the South seldom is more than five cents, and often, as in the case of the cigar industry it is only two cents variation. Eliminate the highly specialized industries of the North and the average wage rate would give the appearance of being somewhat low to say

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the least.

Instead of requiring the use of this hypothesis, however, the South during the past decade has experienced an enormous expansion of existing industries and the establishment of many new ones requiring skilled operators. This has brought about a marked increase in the average wage rate. As this trend continues, the discrepancy between the average wage rate of the North and that of the South will become smaller and smaller. In the meantime, it should be very clearly understood that labor in the South is *not* cheap. In most industries now undergoing expansion, the southern wage rate is virtually identical with that prevailing in other parts of the country, while in other lines of manufacture the difference is less than the advantage of lower living conditions in the South would appear to justify.

Reference already has been made to the industrial growth of the South during the past decade and the effect this has had on the average wage. The importance of this growth insofar as the labor situation is concerned cannot be overemphasized, for the one thing most needed is not uplift programs, but more employers competing in the labor market for employees. The extent to which that need is being met, in spite of hampering forces at home and abroad, is evident from the following facts. During the eight year period from 1929 to 1937, when almost all manufacturing was suffering curtailment from "depressionitis," in the South as a whole, there was a net growth of 45,815 jobs in manufacturing compared with a loss of 284,137 jobs for the rest of the country. Had the construction industry not been so adversely affected throughout the entire country in this period, southern employment would have reached still greater heights, for building materials, and especially lumbering, occupy an important percent of almost every southern state's manufacturing employment. This is a clear indication of the fact that in the South, industry is doing its part of the job not only in leading the nation to a restoration of economic health but particularly in the employment of labor at a time when agriculture is suffering severe malaise.

Significant too is the wide range of industries in the southern states which show greater employment in 1937 than in 1929. For example, substantial increases in the number of employees occurred in steel works, rolling mills, fruit and vegetable canning, glass, chemicals, stamped-ware and foundry and machine shop products. Men's clothing, shoes, and paper and pulp begin to emerge as industries of importance insofar as employment is concerned, while two industries traditionally associated with the South—textiles and furniture—held their own or showed some gains.

For imported "isms," whether of fascist or communist brand, the southern people have proven to be very infertile soil. They resent mistreatment, just as sturdy folk do in any land. But they also resent attempts on the part of agitators to use them as grist for some revolutionary mill. Therefore, the labor movement in the South has been, for the most part, an orderly growth as laid down by Samuel Gompers many years ago. Southern workers do not look upon the labor movement as a proletarian struggle for the overthrow of private property and will not countenance any attempts of outsiders to use them for that purpose.

It may be true that organized labor in the South has increased in numbers during the past several years, but the percentage of organized workers is still substantially smaller there than it is in the country as a whole. So far, the majority of unionization has occurred in the heavy industries such as iron and steel, coal mining, petroleum, shipbuilding, etc.

Textiles and tobacco manufacturing, which long were considered impervious to unionism, also are now covered by union agreements. It should be clearly understood, however, that unionization is far from complete in any one of these industries or even in any given state. In sharp contrast to the industries mentioned above, in the retail trade, service industries, chemicals, and lumber, labor is generally unorganized.

About ten years ago, a southern manufacturer speaking before the Institute of Public Affairs at the University of Virginia, declared himself in favor of a labor policy which would "have written in the boldest letters across the very top of it—The Open Shop." In this respect, it should be noted that a great many of the trade agreements in southern manufacturing plants do not have the "closed shop" provision; they provide that the union shall be the bargaining agency for its members, but the worker's employment is not conditional upon union membership. As long as the southern population remains as highly decentralized and rural as at present, it is extremely unlikely that organized labor movements will acquire anything like the following they possess elsewhere. To the average southern employee, unionism has little or no benefits to offer in the present state of affairs.

Again referring to the southern manufacturer quoted above, in the same talk he said, "We must destroy not only the use of the term, but any occasion for its employment—'cheap and docile labor.' The labor of the South is neither cheap nor docile, in the sense that it can be purchased at any price or managed in any way." Perhaps nothing is so important as to make clear this fact in the minds of those who do not know the South. Though it was said ten years ago it still is true today. Too many people unacquainted with the South regard it as a land of cheap wages. The trend of wages in the South constantly is upward, while the intelligent handling of employee relations in this area has demonstrated that the advantages to be obtained therefrom are, perhaps, greater than in any other section of the country.

The wage bill is, in most manufacturing industries, the largest bill which the enterpriser has to pay; and present-day management realizes that the problem of purchasing manpower is just as important or more so than the problem of purchasing materials. It is a task for the specialist, and it requires a far wider range of capabilities than is needed by the purchaser of materials, fuel or power. For the purchase of man-power involves more than mere ability to assess values and to bargain shrewdly. It involves the ability to evoke co-operation from those who deliver the man-power. And this is a continuing task; it is never finished. It requires whole-hearted understanding and participation on the part of every executive, from sub-foreman to works manager.

In non-manufacturing employment, such as stevedoring, railroading and building construction, the colored people of the South have had a firm foothold for many years, although chiefly in unskilled work. They are also employed in considerable numbers in the lumber, steel and fertilizer industries, in coal mining, tobacco processing, and in certain departments of the cotton mills. These people have contributed a large part to the industrial development of the South, being loyal, hard working and intelligent. That they will continue to do so is certain, but their share will be infinitely greater as industry finds more abundant job opportunities for them and takes full advantage of the vocational education these people now are receiving.

Altogether, one reaches the inevitable conclusion that southern labor will prove to be one of the greatest assets a manufacturer in the South could possibly have.





## Industrial Opportunities in the Southeast

The many advantages offered by the Southeast—adequate transportation and power facilities, quantities of raw materials, a mild all-year climate and a rapidly expanding consumer market—continue to attract the attention of industrial executives interested in locating additional manufacturing or processing plants where manufacturing and distributing costs are favorable.

Why not "kill two birds with one stone" and arrange a vacation trip through the South and take that opportunity of investigating first hand the advantages of this region for location of the plant you have been thinking about?

The Atlantic Coast Line Railroad, through its Development Service, will gladly furnish information in regard to industrial opportunities, sites, warehouses and raw materials in territory served by its lines in Virginia, North Carolina, South Carolina, Georgia, Florida and Alabama.

INQUIRIES ARE INVITED:

**J. M. FIELDS**

Manager Development Service  
Wilmington, North Carolina

# ATLANTIC COAST LINE RAILROAD

SOUTH'S RESOURCES ISSUE

51

# THE TRANSPORTATION FACILITIES OF THE SOUTH

ABOUT thirty-five years ago William Sydney Porter (O. Henry) wrote one of his finest stories of the South, *Hostages to Momus*. It dealt humorously with the kidnapping and holding for \$10,000 ransom of a Georgia railroad president by two crooks who were also excellent cooks. The fame of the cuisine reached the railroad office, and soon the entire personnel of the ten-mile road, all eleven of them, were eating the kidnappers out of their mountain retreat. The latter, when the light finally dawned on them, turned it all off into a joke when a ninth mortgage on the president's farm and a peach crate full of railroad bonds raised \$137.50.

Though O. Henry's kindly caricature is still supported by the South's possession of a number of small railroads, the South is served by rail, highway, water, and air transport facilities that, by any comparative standard, must be considered good. This system of transport is marked, however, by certain characteristics peculiar to the local situation that must be taken into consideration by any one who wishes to understand the South and its place in our national transport picture.

First, there is the matter of distances. If the Western states be omitted, the southern states are all relatively large. Georgia, in fact, is the largest state east of the Mississippi. It is farther from the western end of Florida to Miami than it is from Boston to Cleveland; Norfolk is about the same distance from Mobile than Portland (Maine) is from Cincinnati. A motor trip from Chicago to Miami is not half completed when Atlanta is reached.

Secondly, the relatively sparse population of the South makes for a low density of traffic (for high grade freight—not total freight) on its highways and railways. The ten states of Alabama, Florida, Georgia, Kentucky, Mississippi, North and South Carolina, Tennessee, Virginia and West Virginia have a population of 23,324,028 spread over an area of 449,626 square miles; whereas, the three states, New York, Pennsylvania and New Jersey, have 26,260,750 people in an area of 102,554 square miles.

## Railroads

Class I railroads provide fast and frequent freight and passenger schedules over an aggregate trackage approximating 80,500 miles. One of the country's first diesel stream liners was put in service by the Gulf, Mobile, and Northern in 1935, and last winter the Atlantic Coast Line followed the example of the Seaboard of the year before by placing in operation diesel streamlined trains from New York to Florida designed both for the luxury trade and for those who must travel economically. Both types of service were a great success. The service furnished by southern roads in north-south and north-east, south-west directions is decidedly the best offered. There is no single direct line from the Atlantic Coast to the Mississippi and the rugged Southern Appalachian Mountains make northwest-south-east movement difficult. They account for the importance of Atlanta as the crossing point for the two move-

ments. However, from the point of view of service the South suffers no undue handicap. The Illinois Central in particular has pioneered in the field of package freight service from Chicago and Louisville to Memphis and other southern points so that other roads are likely to follow its example.

Southern territory, for rate making purposes, is the territory east of the Mississippi and south of the Ohio and, roughly, a line drawn from Cincinnati to Norfolk. Obviously most of Virginia and West Virginia are outside this territory, but Virginia and most of West Virginia are included in the Southern District as defined by the Interstate Commerce Commission.

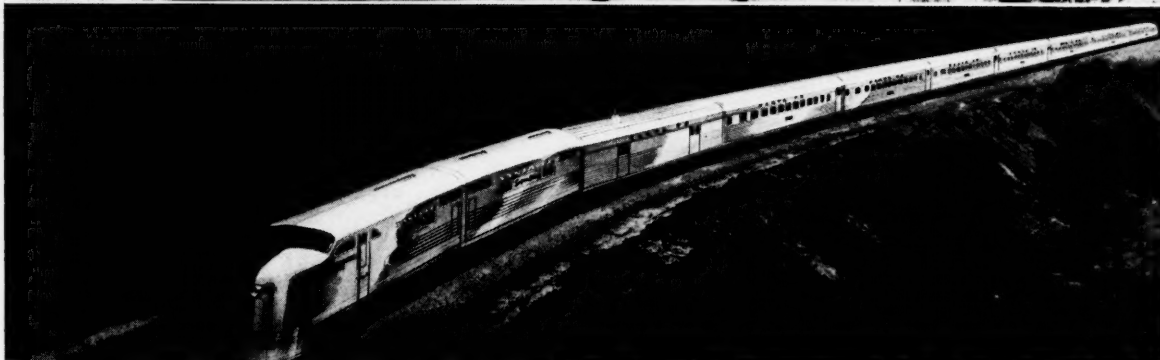
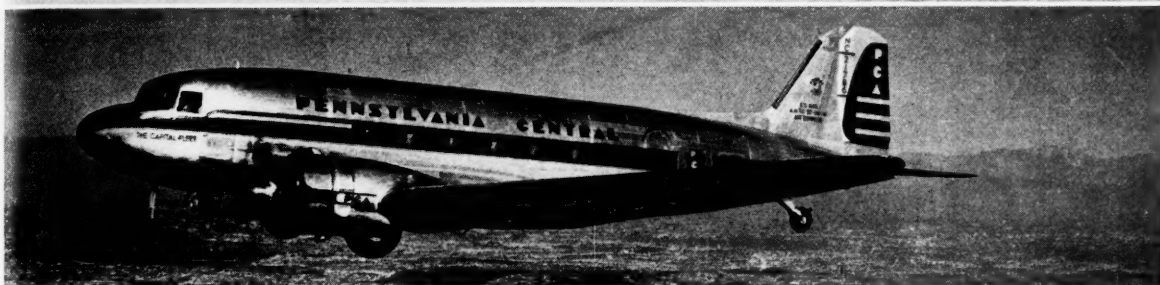
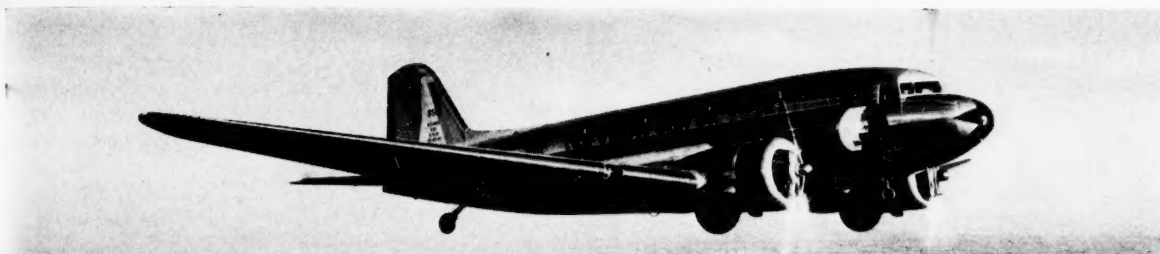
Lengthy discussion of the Southern class rate controversy has no place in a brief survey of the transport facilities of the South, especially as the matter is still unsettled, though in a five to four decision the Commission recently lowered the rate into Official or Eastern Rate Territory on a few articles.<sup>1</sup> It may not be significant but it is certainly interesting to note that all four dissenting votes were cast by members from Official Rate Territory.

It is encouraging to note that the Commission, on its own motion, has decided to investigate the entire class rate structure east of the Rocky Mountains. It is to be hoped that a settlement of this controversy, based on facts and not on sectional interests, may come out of this re-examination. It should be pointed out in passing that commodity rates in the Southern District are not a subject of complaint. The movement of raw materials is free enough. The complaint of the South is that manufacturing is hindered because the producer is faced with freight charges into the Eastern District, where 51 per cent of our population is located, higher than those his competitor located in that territory pays for a haul of equal length. This disparity varies, of course, but probably averages twenty-five to thirty-five per cent.

## Highways

No traditional rate-making rules have handicapped the development of truck and bus movement in the South, and both have flourished lustily. Though both these forms of transport have taken much business from the railroads there is no doubt that they have created much of it for themselves; in other words, it is traffic that otherwise would not have moved. Some idea of the magnitude of passenger traffic can be had from the following: In 1938 intercity motor carriers of passengers operated vehicles over 35,077 miles of highway in the Southern District, 50,833 miles in the Eastern District and 88,505 miles in the Western District; and the passenger revenues from this traffic were \$23,548,000, \$38,595,000 and \$41,934,000, respectively, for the three districts. Since, as was noted above, the population of New York, New Jersey and Pennsylvania exceeded that of the entire Southern District the

<sup>1</sup> 235 U. S. 255. *State of Alabama, et al. vs. The New York Central Railroad Company, et al.*, decided November 22, 1939.



Pictured here are some of the South's finest air and rail mediums of transport. From top to bottom: Eastern Air Lines' 1940 Silver-sleeper on its way to Brownsville, Texas, from the International border where connection is made with Pan American Airways for Mexico; one of Pennsylvania Central Airlines' planes serving Virginia; Missouri Pacific Lines' latest streamliner; the Santa Fe's new stainless steel "Super Chief"; the Seaboard Air Lines' "Silver Meteor," the first streamlined stainless steel diesel electric coach train in service between New York and Florida.



comparative extent to which the bus is used in the South is quite evident. Altogether there were 23,019 busses operating in the South in 1938 or almost half the number for the entire country.

In the realm of motor carriers of property there were 1,577,959 vehicles registered in the South in 1938 paying \$24,311,000 in registration fees while all motor-carrier tax receipts aggregated \$4,298,000. Again comparing the Southern District with that of the Eastern and Western Districts, the revenue of Class I motor carriers (common and contract) of property in the calendar year 1938 was \$27,371,000 for the Southern District against \$200,687,000 and \$89,345,000 for the Eastern and Western Districts respectively. Since the South is largely agricultural it may be that a larger relative share of the trucking there is not reported for statistical compilation. Nevertheless, the lower industrialization is sharply reflected in the comparison with the Eastern District. It is the low population density already referred to, together with lack of heavy industry, more than any other, that has caused gasoline taxes and freight rates in the South to be higher than those in many northern states. South Carolina, for example, at the close of 1937 had 4,287 miles of surfaced highways of a type better than gravel or rock, and of this total 1,809 miles were Portland cement concrete. The corresponding mileages for Connecticut were 2,484 and 608; yet there were only 296,224 registered motor vehicles of all types in South Carolina in 1937 as compared with 436,564 in Connecticut and South Carolina received in 1938 from a six cent gasoline tax only \$11,451,000 as compared with \$9,471,000 received by Connecticut from a three cent tax.

A corollary of this low traffic density on the highways in the South is the lack of funds for local, or county, road improvement since the primary roads, of which the South may be justifiably proud, have absorbed the major part of available funds. Consequently paved farm-to-market roads are not too numerous except in those areas where relatively high property values make their construction possible from local property taxes, as in the Bluegrass region of Kentucky for example, or in a county where some sizeable city is located. It was natural that the most pressing needs should be filled first in the form of a primary system of highways that would give all-weather access to all sections of the state and today more than 250,000 miles of highways in the sixteen southern states are all-weather surfaced.

Highway construction in the South is proceeding at a satisfactory pace. During 1937 highway expenditure exceeded \$374,000,000 of which \$245,318,000 was derived from

vehicular registration fees and taxes on gasoline and motor carriers. In the hill country of West Virginia, Virginia, Kentucky, Tennessee, and North Carolina road building is especially expensive. Parts of northern Alabama and northern Georgia suffer from the same handicap. However, it may be said that now all portions of the South are accessible by all-weather highways and that part of it is well supplied with hard-surfaced road. Visitors from heavily populated areas frequently marvel at the light traffic on some of the South's highways, particularly during week-end and holiday periods. It offers great possibilities of development especially as a channel of distribution for goods produced on or close to tidewater moving from one part of the South to another and to and from southern ports and Pacific and North Atlantic ports.

### Airways

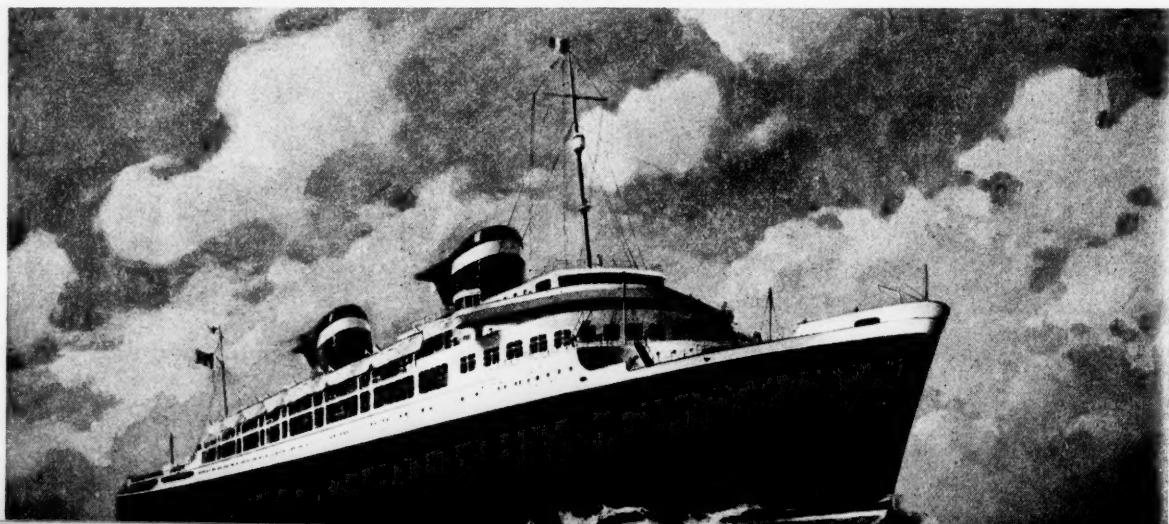
A glance at the map of the South on pages 74-75 shows the extent of this region's transportation facilities, including the present network of airlines from which it is evident that the southern states are relatively well supplied with air transportation facilities. Atlanta, Memphis, St. Louis, Oklahoma City, Dallas and Houston are the most important radii of airlines, and Miami is the terminal for the Caribbean, Central and South American traffic. In addition to the lines already established applications are before the Civil Aeronautics Authority for the approval of several additional routes in the Southern states, including one from Norfolk to Wilmington, N. C., and then possibly to Charleston, S. C. Another application which would greatly benefit the South is that of Seaboard Airways, Inc., a subsidiary of the Seaboard Airline Railway, for lines running from Boston to Miami and from Boston to New Orleans, with stops at intermediate points.

The most recent figures available regarding air transportation are the following, as of January first, 1939. The total number of aircraft registered in the South on that date was 2,842, and there were 5,152 licensed pilots. There were 718 airports and landing fields in the sixteen southern states, of which number 241 were partially or fully lighted. However, it should be remembered that recent developments, particularly the increasing importance of national defense, are not only resulting in large increases in the number of aircraft and pilots, but in the number of airports and landing fields as well.

### Waterways

In the economic life of a state or nation, waterways occupy

*The S. S. America, now on its maiden voyage and the largest liner ever constructed in the United States, was built at Newport News, Virginia, by the Newport News Shipbuilding and Drydock Company. 723 feet long with a beam of 92 feet, this vessel has a load draft displacement of 34,000 tons and will carry 1,209 passengers and a crew of 639.*





**"I became convinced  
That The South Had The Greatest  
Economic Future of Any Section  
of The Country." . . . . .**

said General Robert E. Wood, Chairman of the Board of Sears Roebuck and Company, in a recent speech before a group of business men.

Acting on that belief, Sears has, in 12 years, invested more than \$15,000,000 in mail order plants, retail stores and factories in the area south of the Ohio River. And this great industry is not alone in its conception of Southern development and possibilities—others have seen and have acted.

Why don't you, too,

**Ask The Illinois Central** why the fertile Southern area of which it is so much a part holds unusual advantages for industries seeking to improve operating conditions and increase profits.

Your inquiry will be held in strictest confidence and will be the means of supplying you with interesting and dependable facts and figures.

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an important part through one or more of several different uses—as recreational factors and contributors to the scenic effect, as drainage or irrigational factors in agriculture, as a source of domestic water supply, as a source of power, as a source of materials (fish, minerals, sponges, etc.), and as a means of transportation. A glance at a map of the United States reveals that the South is amply supplied with waterways of every kind and to a degree greater, perhaps, than any other part of the nation even though it does not possess any large bodies of inland water comparable with the Great Lakes.

As recreational factors or contributors to the scenic effect, inland southern waterways offer attractions certainly no less fine than those to be found elsewhere, especially in the mountain regions, while with 2,816 miles or more than half the nation's general coast line and almost two-thirds of the entire tidal shore line, the South presents unparalleled opportunities in this direction. For drainage and irrigational purposes the southern waterways are being increasingly utilized to a greater extent than ever before. As a source of domestic water supply one only has to look at the list of towns and cities deriving their needs from these surface and ground water streams to realize their value while the number of industries such as rayon, pulp and paper, chemicals and textiles which have been attracted South partly because of the available water supply is self evident. As a source of power Southern waters are the medium of public utility power plant capacity aggregating about 3,500,000 kilowatts or approximately one-third the hydroelectric capacity of the nation. In the matter of waterways as a source of materials, one has only to point to the fishing industry of the South, the sponge industry with the largest sponge exchange in the world, and the bromine and other extracted chemicals. However, it is as a means of transportation that we are here concerned with the South's waterways and as such they offer enormous possibilities.

Taking first of all the inland waterways, every one of the sixteen Southern states has waterways providing access to the ocean. The most important of these is the Father of Waters, the Mississippi River, which has a maximum depth of thirty-five feet and a minimum depth of nine feet. This river borders the states of Louisiana, Mississippi, Arkansas, Tennessee, and Missouri, and serves these states with water transportation in all seasons of the year. Also, by means of its tributaries, of

in all directions to literally honeycomb the major part of the nation's largest market and manufacturing area. In all the southern states adjoining the Mississippi and its tributaries most of the larger manufacturing regions have navigable waterway connections leading to northern markets and ocean outlets. And, at all principal points throughout their length, these rivers have warehouse facilities and means of loading or unloading the great variety of products transported annually. Altogether, that part of the Mississippi and its tributaries in seven southern states carried a total volume of traffic in 1938 of 54,288,939 tons valued at \$1,332,550,922.

In addition to the Mississippi, other rivers in ten southern states in 1938 carried a total tonnage of 21,175,705 tons valued at \$482,317,179 made up as follows: Maryland rivers, 1,131,051 tons valued at \$13,448,622; Virginia rivers, 7,296,871 tons valued at \$221,263,760; North Carolina rivers, 1,503,738 tons valued at \$35,279,473; South Carolina rivers, 245,143 tons valued at \$2,923,763; Georgia rivers, 222,661 tons valued at \$1,053,981; Florida rivers, 575,399 tons valued at \$38,904,786; Alabama rivers, 3,343,574 tons valued at \$75,588,592; Mississippi rivers, 114,003 tons valued at \$276,059; Louisiana rivers, 6,052,328 tons valued at \$88,823,840; and Texas rivers, 690,937 tons valued at \$4,754,303. Such figures do not include the volume of traffic on federal, state and private canals and connecting channels which totaled for all southern states 72,142,080 tons valued at \$1,262,800,951. Perhaps one of the most valuable uses of southern rivers is that they provide a medium of transporting raw materials at low cost from the point of origin to the manufacturing center by means of company owned barges. This has proved especially true in the case of shipping pulp wood to the pulp and paper mills as well as in the petroleum industry. Doubtless it will be emulated by other industries whose plants are situated on tide-water or adjacent to navigable waterways.

Combined with the South's extensive inland waterways for commercial use are the great number of coastal ports whose total traffic in 1938 according to the U. S. Army Chief of Engineers, was 200,142,120 tons valued at \$5,405,573,057. Atlantic coast ports trade was 62,388,727 tons valued at \$2,241,341,081 and Gulf coast port trade was 137,753,393 tons valued at \$3,164,231,976. A breakdown of this commerce by coastal states is as follows:

STATE	Foreign imports		Foreign exports		Domestic traffic		Total trade*	
	Tons	Dollars	Tons	Dollars	Tons	Dollars	Tons	Dollars
Maryland . . . . .	4,821,509	66,121,513	1,310,537	80,861,658	14,625,479	529,231,379	20,757,525	676,214,550
Virginia . . . . .	856,189	65,384,209	1,992,564	128,008,597	24,676,360	756,147,895	27,525,113	949,540,701
North Carolina . .	203,578	5,757,239	80,144	13,145,658	2,120,623	60,738,408	2,404,345	79,641,305
South Carolina . .	488,520	15,762,966	247,608	8,904,905	2,024,198	69,003,944	2,760,326	93,671,815
Georgia . . . . .	488,604	12,293,310	337,220	20,196,240	2,803,450	153,585,965	3,629,274	186,075,515
Florida . . . . .	710,497	29,591,495	1,990,333	33,749,336	8,901,955	321,907,170	11,602,785	385,248,001
Alabama . . . . .	406,794	7,064,584	1,420,296	33,977,792	2,936,302	100,208,632	4,763,392	141,251,008
Mississippi . . . .	78,996	1,320,777	98,246	2,734,623	365,004	5,132,086	542,246	9,187,486
Louisiana . . . . .	2,779,154	104,301,799	4,745,019	206,311,127	22,779,520	792,812,271	30,303,693	1,103,425,197
Texas . . . . .	927,449	33,474,281	18,822,692	418,972,635	76,003,280	1,335,870,586	95,753,421	1,788,317,502

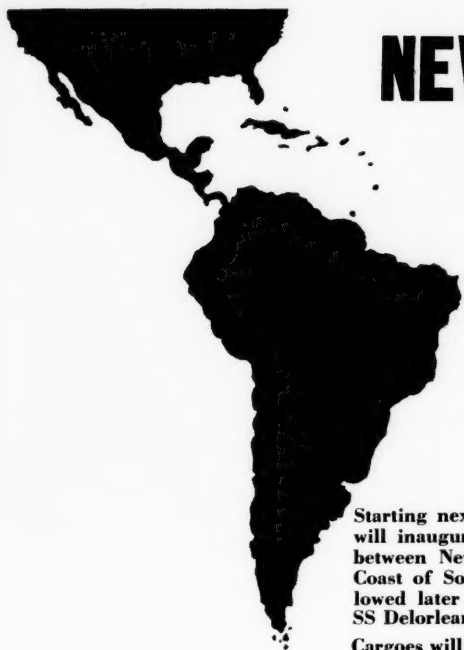
\* Does not include river, ferry or canal traffic or cargoes in transit.

which the most important in this connection is the Ohio which borders the states of Kentucky and West Virginia and the Illinois, the South is connected directly with the great industrial areas of Minnesota, northern Illinois, and western Pennsylvania. Furthermore, it should be remembered that these rivers directly connect the Great Lakes with the Gulf of Mexico while smaller tributaries in large number stretch out fanwise

These figures speak for themselves as to port facilities in the Southern states while the great variety of products passing in and out necessitates ample warehouse space and the most modern materials handling equipment.

Coastal and intercoastal traffic is increasing steadily. Rates are reasonable and service is good from the delta of the Rio Grande all the way up the Atlantic coast.





# NEW 10 MILLION DOLLAR LINK WITH SOUTH AMERICA

Underwrites "Good Neighbor" Policy  
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Starting next June the SS Delbrasil will inaugurate a new era of travel between New Orleans and the East Coast of South America—to be followed later by her sister ships, the SS Delorleans and Deltargentino.

Cargoes will be speeded into and protected by the most modern holds,

refrigerated compartments, and high speed booms. Special provision has been made in all three ships for the carrying of perishable and special cargoes. Passenger facilities include 26 spacious staterooms, a library, beautifully decorated dining rooms, bar, and lounge—in short, the complete design for modern travel.

SS Delorleans, as she was launched in Baltimore and is now being completed. She and her sister ships, with a speed of 16½ knots, will be the fastest out of the Gulf to the Good Neighbors of South America.



## DELTA LINE

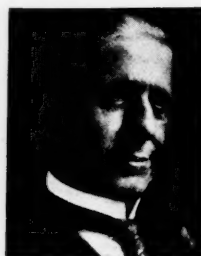
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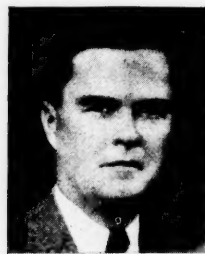
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**WE, THE GOVERNORS...** invite industrial leaders of the nation to consider the vast natural resources of the South.

Unlimited raw materials. The South produces 20% of the nation's pig iron, 17% of the hot rolled steel, more than five-sixths of the cotton consumed, more than five-sixths of the cottonseed crushed, 40% of the rayon, more than 68% of the fertilizer. The South also produces 100% of the naval stores, 100% of the sulphur, 50% of the bituminous coal, 60% of the natural gas, 60% of the crude petroleum, 100% of the bauxite, 75% of the Fuller's earth and 100% of the phosphate.

In addition to savings in shipments on raw materials, the South also offers strategic locations for plants serving the richest markets . . . A moderate, year 'round climate, affording lower construction and production costs . . . Cooperative, native-born labor . . . One-third of the installed hydro-electric power capacity.

## *Southern Governors' Conference*

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# TAXATION IN THE SOUTH

BY

Weldon Welfling

IN a survey of taxation in the South as brief as this one, only a cursory description may be made of those taxes which are likely to be of most interest. The aspects of taxation to be considered are the kinds of taxes, the rates used, and the relative burden of the different taxes in different states. From the point of view of the business man, taxes may be classified according to whether they affect all business, specific businesses, or people and property as such without regard to business connections. The first group would be represented by corporate organization, franchise and income taxes (to the extent business is incorporated); the second group would include taxes levied upon public utilities, chain stores, liquor manufacturers and dealers, and various license taxes. In the last group would fall gasoline, sales, property and personal income taxes, most of which may be influential in determining business costs as well as are those taxes in the first two groups.

Corporate organization or entrance taxes are very widely used throughout the southern region. Such taxes are usually based upon the authorized capital stock, and are graduated according to the number of shares or amount of capital. Alabama, however, levies a tax of \$1 per \$1,000. The Arkansas rates vary from one cent a share for 10,000 shares to \$550 plus 25 cents a share on those over 100,000. The Florida tax is graduated: \$2 per \$1,000 up to \$125,000 after which there is an extra \$0.50 per \$1,000 up to \$1,000,000, then an additional 25 cents up to \$2,000,000, and after that an additional ten cents. In North Carolina the tax is \$1.75 per \$1,000.

Franchise taxes are also the rule rather than the exception. These, too, are ordinarily based on capital stock or some other measure of capital. Corporation permit taxes are also found. The franchise tax is often between \$1.00 and \$2.00 per \$1,000. It is \$2.00 in Alabama and Louisiana, \$1.00 in Mississippi and Oklahoma, \$1.75 in North Carolina, and \$1.50 in Tennessee.

The corporation income tax is levied in all states of the South except Florida, Texas and West Virginia. The rates, none of which are graduated except in Mississippi, range from one-half of one percent to six percent of net income above exemptions. Provisions restricting taxable income to that earned within the state are general. The rates frequently are approximately the same as those levied on personal net incomes. The rates, both corporate and personal, are summarized below:

State	Personal		Corporate
	Rate Range	Top Bracket	
Alabama	1½-5	\$5,000	3
Arkansas	1 -5	25,000	2
Florida	....	....	.

Georgia	1 -7	20,000*	5½
Kentucky	2 -5	5,000	4
Louisiana	2 -6	50,000	4
Maryland	½	.....	½
Mississippi	2½-6	15,000	2½-6†
Missouri	1 -4	9,000	2
North Carolina	3 -7	10,000	6
Oklahoma	1 -9	9,000	6
South Carolina	2 -5	6,000	4½
Tennessee	4 -6‡	.....	3¾§
Texas	....	.....	.
Virginia	1½-3	5,000	3
West Virginia	1 -4	3,000	.

\*Minimum filing fee of \$2.00.

†Graduated to \$15,000.

‡6 per cent on income from securities, unless company is located in Tennessee.

§Called excise tax.

It is apparent from the above figures that, although the rates for the corporate income tax are relatively low in comparison to those embodied in the federal law, there are rather wide differences between states. Thus the rate in North Carolina and Oklahoma is three times as high as in Arkansas and Missouri, twice as high as in Alabama and Virginia, and fifty percent higher than in Kentucky and Louisiana. Comments concerning the relative burdens of income taxes paid in various states are made in the discussion of the personal income tax below.

Other business taxes which are paid by only specified industries are certain taxes on public utilities, chain stores, liquor dealers and manufacturers, and a host of industries and professions required to pay license fees. It is not uncommon, however, especially in the case of utilities, to require such taxes in lieu of certain property taxes. Gross receipts taxes on public utility enterprises are not uncommon. For example, there is a tax of four mills on the dollar in Alabama and three percent in Kentucky for electric utilities. Miscellaneous utilities pay two mills on the dollar in Alabama, 1.5 percent in Florida, two percent in Louisiana, and a privilege tax of six percent of gross receipts in North Carolina. The manufacture of hydro-electric power is sometimes taxed separately: two-fifths of a mill per kilowatt hour in Alabama and one mill per hour in South Carolina.

Chain store taxes are almost universal in the South, in response to the antipathy to this method of retailing. Most of these taxes progress steeply according to the number of stores, although there is considerable variation both in the rates and in the number of stores subject to the maximum rate. In Florida the tax per store rises from \$10 to \$400 for the fifteenth store, while in Georgia the tax is \$2 for the first and \$200 for the fortieth store. Kentucky is probably the hardest



on chain stores, with a tax of \$7,352 plus \$300 for each store over fifty; this tax progresses from \$2 for the first store.

One of the most complicated and typically southern types of taxes is the network of licenses and occupation taxes levied by the state governments. Such taxes, usually considered as regulatory weapons, are frankly employed as revenue devices in this region. However, with the growth of other forms of taxation, such as the gasoline and income taxes, license taxes no longer form an important part of total state revenues, although they are doubtless important costs to the enterprises involved. Such taxes are based on a wide variety of business characteristics and make for a highly complex tax system. Professor Roscoe Arant, writing in *The Tax Magazine* (July, 1938) listed eleven important objective elements used in determining the tax base:

1. The type of occupation.
2. The population of the community in which the business is engaged.
3. The kind or size of product sold.
4. The number of units of some essential equipment used.
5. Room or producing capacity.
6. The number of employees.
7. Kind and size of equipment or power.
8. Length of time, or number of jurisdictions, in which the business is conducted.
9. The volume of actual production.
10. The amount of invested capital.
11. The amount of fee or price charged.

Numerous extractive industries find they are required to pay severance taxes in several southern states. These taxes, too, show considerable diversity from state to state, and may best be described by some isolated examples. The usual bases for severance taxes are quantity produced and value of production, and often the same state uses both bases. The rates also vary within the same state for different products. Oklahoma has a gross production tax in lieu of other taxes; the rates vary from three-fourths of one percent for various minerals to five percent for oil and gas. In Texas the rate varies with the price of oil, but according to the kind of ore produced. Arkansas has various rates for different commodities, such as the seven cents per 1,000 feet of timber.

Finally, to complete the picture of taxation in the South, certain general taxes should be considered. These remaining taxes are important in estimating the total tax burden in this section of the country, although they are not levied upon business acts as such. Principally, these taxes are the sales tax, gasoline and motor vehicle taxes, personal income taxes, death taxes, and property taxes. Sales taxes are a very important element in the revenue systems of the South. Two percent seems to be the most usual rate of taxation of gross receipts or general sales: this rate is used in Alabama, Arkansas, Louisiana, Missouri, Oklahoma and West Virginia. In certain states the rate varies according to the type of business, and in others the tax is levied only on certain types of businesses or sales. North Carolina collects one-half of one percent on wholesale transactions and three percent on retail sales.

Great reliance is also placed upon the gasoline tax, in the southern states even more than elsewhere. In 1938 thirteen of the forty-eight states collected more than 35 percent of their revenues in this form, and eight of the thirteen were southern states. Georgia, Tennessee and Florida collect over half of their revenues from the gasoline tax. The usual rate of tax in the South is six cents per gallon. The average for

the whole country is less than four cents, but for nine southern states it is 6¼ cents.

The rates for the personal income tax have been listed above. In this connection the findings of the Twentieth Century Fund (in *Studies in Current Tax Problems*) are of interest in estimating the actual burden of the income tax. In this study allowance was made for the taxation of income through both corporate and individual income taxes. The study covered eight states which were chosen in such a way as to represent states with divergent income tax practice. A striking result of this study was the apparent uniformity in tax burden from state to state, even in states not having income taxes. The cause for this uniformity is the preponderance of the federal tax in the whole tax burden; in other words, variations in state rates do not alter the total payments as much as might be expected. Because of this uniformity, only four states are represented in the table below, two northern and two southern states, plus a non-tax state. The figures are the percentages of potential incomes at different levels payable by a hypothetical taxpayer with three dependents and whose income is half salary, half corporate dividends.

STATE AND FEDERAL INCOME TAXES PAYABLE  
BY HYPOTHETICAL TAXPAYER

Income	State				
	Non-Tax	New York	Minnesota	N. Carolina	Oklahoma
10,000	9.6	11.8	11.3	12.6	12.0
20,000	13.1	17.2	15.0	16.7	16.0
30,000	16.4	20.8	18.3	20.1	17.5
40,000	19.4	24.0	21.3	23.1	22.5
50,000	21.8	26.4	23.7	25.2	24.9
70,000	26.7	30.8	28.2	29.9	29.3
100,000	34.6	37.7	35.7	37.0	36.3

It is apparent from these figures that the percentage of income taken by income taxes in the two southern states is slightly lower than in New York and slightly higher than in Minnesota.

The property tax may also be summarized most clearly by the use of a table. It is difficult to come to any very definite conclusions concerning the burden of the property taxes in different states without a study of the local rates, which may vary widely not only from state to state but within states, and a study of the relation of assessments to true value. Numerous studies have pointed out the variance between assessments and market values between areas in the same state. However, a compilation of the rates levied may be of interest, and throw some light on the trend of state property taxation. The figures below show the state rates for selected years since 1925.

STATE PROPERTY TAX RATES

State	Year			
	1925	1929	1933	1936
Alabama .....	.65	.65	.65	.65
Arkansas .....	..	..	..	..
Florida .....	1.05	1.42	.66	..
Georgia .....	.50	.50	.40	.30
Kentucky .....	.30	.30	.30	.05
Louisiana .....	..	..	..	..
Maryland .....	.27	.26	.25	.22
Mississippi .....	.80	.80	.80	.80
Missouri .....	.11	.14	.15	..
N. Carolina .....	..	..	..	..
Oklahoma .....	.25	.35	.33	..
S. Carolina .....	.55	.50	.50	..

Tennessee .....	.25	.25	.20	.08
Texas .....	.77	.68	.77	..
Virginia .....	..	.50	.50	..
W. Virginia .....	.14	.19	.07	..
New York .....	.15	..	..	..
Pennsylvania .....	.40	.40	.40	.80
Massachusetts .....	.18	.12	.13	..
California .....	..	..	..	..
Minnesota .....	..	.55	.84	1.37

These figures indicate, more than anything else, the trend toward state abandonment of the property tax. Alabama and Mississippi maintained the same rate throughout, but all the other southern states show declining rates. Five other states are included for comparison, and it may be seen that Minnesota and Pennsylvania go counter to this trend.

In conclusion we may survey the whole field of state taxation in order to get a picture of the revenue systems of the South. The following table was constructed by listing the four most important taxes in each of the southern states in order to gauge their relative importance throughout the region.

#### RELATIVE IMPORTANCE OF VARIOUS TAXES IN SOUTHERN TAX SYSTEMS, 1938

Tax	Number of states in which tax was			
	First	Second	Third	Fourth
Gasoline .....	14	2	..	..
Motor Vehicle .....	..	2	6	6

Net income .....	..	3	2	3
Alcoholic Bev. ....	..	2	1	4
Gross Receipts* .....	2	2	3	..
Property** .....	..	2	3	..
Severance .....	..	3	..	..

\*And similar taxes, such as general sales.

\*\*State tax only.

The above-mentioned importance of the gasoline tax is apparent, in that fourteen of the sixteen states collect more from that source than any other. The motor vehicle tax appears fourteen times in this tabulation. The states which have a net income tax in second position are Georgia, South Carolina and North Carolina.

The importance of these particular taxes shows that in relying on them the southern states are not far from the experience of the nation as a whole. For all states, including the southern, the order of the five most important taxes is:

Gasoline .....	25%
Gross Receipts, etc. ....	14%
Net Income .....	13%
Motor Vehicle .....	12%
Alcoholic Beverage .....	9%

The extent to which the southern states rely on these specific taxes, however, is greater than is the case with other states in general.

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MANUFACTURERS RECORD



# THE CLIMATE OF THE SOUTH

BY

J. B. Kincer

*U. S. Weather Bureau*

**A**N outstanding feature of the climate of much of the South is the abundance of sunshine in winter, and comparatively light precipitation, except in the Southeast, during the fall months, or harvest season. Also the relatively large number of clear days.

The following outline of the climate of the South refers particularly to the States of Maryland, Delaware, Virginia, West Virginia, Kentucky, Tennessee, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Arkansas, Missouri, Oklahoma and Texas.

In general, physical climate, as distinguished from solar climate, may be considered under three divisions, viz., marine, continental and mountain. Marine climate is influenced and largely controlled by contiguous large bodies of water, and is characterized by comparatively uniform temperatures in all seasons, with small diurnal and annual ranges. Also the progress of the seasons is retarded, winter lingering into spring and summer into fall, which gives relatively mild winters, cool springs, and warm falls. Mountain climates are characterized by relatively cool weather throughout the year, and in most cases by more rainfall than occurs on the adjacent lowlands, because of the orographic influence on ascending air through which it is cooled to the condensation point. Continental climate is characterized by rapid temperature changes, marked extremes, and large temperature ranges, both diurnal and annual, the outstanding features being cold winters, hot summers, and, in many cases, marked seasonal variation in precipitation.

All three of these climatic types are found in the Southern States mentioned above. However, while large bodies of water lie immediately south and east of the area, the general eastward drift of the atmosphere and the frequent northerly winds from the interior in winter bring a very definite continental climate to the northern half of the area, and a modified continental-marine climate to south-central sections. There is only a relatively narrow belt along the Gulf and south Atlantic coasts that definitely has a marine type of climate.

That portion of the Coastal area adjoining the Gulf of Mexico and the Coastal Plains in the South Atlantic States may be considered as subtropical, characterized by a warm and comparatively equable climate, with an average winter temperature mostly between 50° and 60° and an average summer temperature of slightly over 80°. Because of the

semi-tropical nature of the climate, the principal crops of these areas are winter truck, citrus fruits, sugar cane, and rice. The winters are usually mild, although an occasional cold wave with freezing temperatures may occur. In fact, freezing weather reaches the east Gulf coast every winter, while a temperature slightly below zero has been recorded as far south as extreme northern Florida. The summer temperatures are appreciably tempered by proximity to the water with the warmest weather occurring a considerable distance inland. Higher summer temperatures are frequently recorded in the central and northern Great Plains region than has ever been experienced along the Gulf coast.

Except in the limited areas mentioned and a few mountain regions, particularly the southern Appalachian system, the climate of much of the South partakes of either the true continental type, or a combination of the marine and continental. The latter obtains principally in a belt comprising the eastern Piedmont section, from Virginia to Georgia, and also the interior of the Gulf States. In these areas the prevailing winds during the warm season of the year are from the south, but are frequently from the west or northwest in winter. The summers are warm, but an occasionally severe cold wave overspreads practically all sections during the winter season.

The topography of the South, as a whole, is comparatively uniform, with important mountain districts restricted to the Appalachian system in the east, the Ozark highlands of Missouri and parts of adjoining States, and some more or less isolated ranges of the Rocky Mountains in extreme western Texas. The most important mountain climate is found in the Appalachians, some peaks of which in western North Carolina rise to more than 7,000 feet above sea level. This area experiences rather cold winters, but cool and very pleasant summers, when the greatest differences between mountain and lowland temperatures occur. The comparatively cool weather of summer, the pure atmosphere, and the picturesque scenery of these mountain districts make them very popular as summer resorts. The Ozarks have only moderate elevations, and marked mountain climatic characteristics are not as much in evidence as in the Appalachians, while the peaks of western Texas, extending locally to heights of 8,000 or 9,000 feet, are more or less isolated and have no great influence on the general climate of the region.

Table 1 shows for the several States comprising the South the average temperature for the coldest month of the year, January, and the warmest month, July; also the highest and lowest temperatures of record. In addition, it contains data showing the average precipitation for each season—winter, spring, summer and fall—and for the year as a whole, the average annual number of days with precipitation and the average number of clear, partly cloudy, and cloudy days.

The following discussion relates to the area as a whole:

### Temperature

The average January temperature ranges from about 55° along the central Gulf Coast, between 55° and 60° in southern Texas and about 65° in southern Florida to around 30° in central Missouri and the Appalachian districts of the Virginia. Thus, the range is about 35° for this midwinter month. However, in July, there is much less difference, the average being slightly more than 80° in more than half the area, and reaching 85° in parts of southwestern Texas. The annual temperature range, that is, the difference between the average of the warmest and the coldest month, increases from the Gulf of Mexico northward. For example, at New Orleans the average January temperature is 54°, and that for July 82°, making an annual range of 28°, while at St. Louis, Mo., in the northern part of the area, the range is from 31° in January to 79° in July, a difference of 48°.

Freezing weather has occurred in all parts of the South except on the Florida keys. However, while cold waves occasionally overspread the southern States, they seldom last, especially in southern sections, for more than a few days, but in Florida and southern Texas where winter crops are extensively grown, they are especially important. The most noteworthy cold waves of the southeast occurred in January 1886, December 1894, February 1895, 1899, and 1917, December 1934, and January 1940. The memorable freeze of February 1899 was the coldest short period of record and brought sub-zero temperatures to the extreme northern portions of Florida, but January, as a whole, in 1940 was the coldest month ever experienced in most of the Southern States.

### Frost and the Growing Season

Excepting parts of the far Southwest and much of California, the South, of course, has the longest growing season, the period between the date of last killing frost in spring and the first in fall, to be found in the United States. However,

no part of the mainland is entirely frost-free, Key West, Fla., being the only Weather Bureau station at which freezing temperatures have never been recorded. Killing frost may be expected annually well southward over the interior of the Florida peninsula to the northern shores of Lake Okeechobee. Over the interior of southern Florida, it occurs, on the average, in half the years as far south as the latitude of Miami, but still farther south the frequency of occurrence is less than half the year.

South of extreme northern Florida and in a narrow belt along the Gulf coast to eastern Texas, killing frost does not occur, as a rule, after the latter part of April, which is true also for a considerable area of southern Texas. In general, the spring frost line advances from March 1 near the Gulf coast to southern North Carolina, northern South Carolina, the north-central portions of Georgia and Alabama, northern Mississippi and southern Oklahoma by April 1. It may be expected after May 1 in the Appalachian Mountain sections as far south as western North Carolina.

The first killing frost in fall naturally overspreads the northern portion of the southern area first. In a normal year, it may be expected during the first decade in October over much of the Appalachian highlands as far south as western North Carolina, and in the north-central portions of Georgia and Alabama and southern Oklahoma by the close of that month. In northern Florida and along the Gulf coast, it does not usually occur until the latter part of November or the first part of December.

This, of course, gives to the Southern States a very long growing season, ranging from about 260 days in the more southern sections to around 200 days in northern Oklahoma and 180 to 190 days in much of Kentucky. However, in the Appalachian highlands the growing season is much shorter, ranging down to only 140 days in some exposed localities in West Virginia and extreme western Maryland.

### Precipitation

In the Southern States there is a much greater variation in precipitation than is found in the case of temperature. The greatest average annual amount, 80 inches or more, occurs locally in the southern Appalachian Mountains, and the least, less than 15 inches, in some small areas in western Texas and northwestern Oklahoma. Aside from that in the southern Appalachians, precipitation, in general, decreases from a maximum of 60 inches, or more, in some east Gulf sections, north-

TABLE I

STATE	TEMPERATURE					AVERAGE PRECIPITATION				AVERAGE ANNUAL NO. DAYS			
	Averages	Record	Win-	ter	ter	Spring	Summer	Fall	Annual	With precipitation	Clear	Partly Cloudy	Cloudy
Alabama	46.6	80.3	112	—18	15.12	14.23	14.34	9.31	53.00	94	161	97	107
Arkansas	41.4	80.5	120	—29	11.98	14.34	11.35	10.39	48.06	86	170	92	103
Florida	59.2	81.3	109	—2	8.65	10.01	20.94	13.16	52.76	105	162	129	74
Georgia	47.1	80.1	111	—12	13.29	12.11	15.55	9.21	50.16	99	168	99	98
Kentucky	36.0	77.2	114	—30	11.77	12.61	11.99	9.08	45.45	109	166	87	117
Louisiana	51.8	81.8	114	—16	14.60	13.79	15.93	10.90	55.22	91	157	103	105
Md. and Dela.	33.7	75.3	110	—40	9.63	11.01	12.73	9.07	42.44	113	140	118	107
Mississippi	47.5	81.1	115	—16	15.26	14.87	13.44	9.29	52.86	93	171	93	101
Missouri	30.8	78.0	118	—40	6.70	11.83	11.99	9.63	40.15	89	172	92	101
North Carolina	41.7	76.9	108	—21	11.64	11.94	16.19	9.99	49.76	108	166	99	100
Oklahoma	38.3	81.8	120	—27	4.41	10.01	9.51	8.01	31.94	65	195	90	80
South Carolina	45.9	80.0	111	—11	11.30	10.69	16.30	9.40	47.69	94	175	95	95
Tennessee	39.2	77.7	113	—32	13.68	14.02	12.73	9.49	49.92	106	156	99	110
Texas	48.4	83.1	120	—23	5.94	8.70	8.09	7.81	30.54	62	180	98	87
Virginia	36.6	75.4	109	—29	9.49	11.03	13.22	8.88	42.62	104	162	101	102
West Virginia	32.8	73.2	112	—37	10.08	11.53	13.04	8.71	43.36	122	147	93	125

ward to about 45 inches in Kentucky, and westward to a minimum locally as low as 10 inches or less in the extreme west. The lowest station annual average is 7.66 inches at Clint, El Paso County, Texas.

The cold season precipitation results largely from the eastward or northeastward movement of cyclonic disturbances, but in the summer it is due largely to local thundershowers. The average number of thunderstorms per year decreases from 80 or 90 in the east Gulf sections to 50 in Kentucky and between 40 and 50 in much of Oklahoma and Texas. Heavy local rains are rather frequent, the greatest 24-hour falls of record being 22.22 at Altapass, N. C., 23.11 at Taylor, Texas, and 23.22 at New Smyrna, Fla., which is the heaviest rainfall for a single day ever recorded in the United States.

The seasonal distribution of rainfall is quite uniform as indicated by the data in Table 1. However, in Texas and Oklahoma there is a rather marked maximum in the spring and summer months, while in the Southeast the greatest average amounts are for the summer and early fall, due largely to excessive rains that attend tropical hurricanes that occasionally pass over these sections.

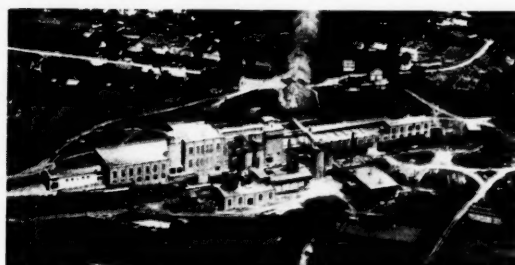
#### Snowfall

In the northern part of the area, there is usually considerable snowfall, the average annual amounts being as much as 10 to 15 inches. However, in the Gulf States, the averages range from about 5 inches in extreme northern Alabama and Mississippi, central Arkansas and northern Texas to 1 inch in south-central Georgia and the southern portions of Alabama and Mississippi. In the northern portion of the southern area the first snow may be expected about the middle of November, but in the central portions of the Gulf States no snow occurs, as a rule, before the middle of December. In some highlands of West Virginia the average annual snowfall ranges up to from 60 to 80 inches.

#### Miscellaneous

Tornadoes are of rather frequent occurrence in much of the South, but fortunately these storms are small in extent, usually only a few hundred yards in diameter, and the probability that any given locality will be visited by one is quite remote. However, the coastal areas of both the South Atlantic and Gulf States are subject to the hazard of tropical hurricanes of irregular and rather infrequent occurrence during the summer and early fall months. These are the most destructive storms in the United States and they produce the principal winds of high velocity and destructiveness experienced in coast sections of the South. Their damage is usually confined to paths averaging 40 to 75 miles in width, and they dissipate rapidly on passing inland; any given section, even on the coast, may experience many years between visitations.

The Southern States, lying in low latitudes, do not experience wide variations in the relative length of day and night between summer and winter. At the time of the summer solstice, June 21, on a clear day in southern Texas and southern Florida the sun shines approximately 14 hours and for the northern section of the area about 45 minutes longer. At the winter solstice, December 22, this is reversed with about 9½ hours in the northern area to around 10½ hours in southern Florida and South Texas. On a clear winter day these extreme southern sections receive about two hours more of sunshine than occurs in the extreme northern portion of the United States, while in the heat of summer, on a clear day, there is two hours less sunshine, and evening comes earlier.



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# MINERALS AND MINING IN THE SOUTH<sup>1</sup>

BY

Paul M. Tyler<sup>2</sup>

THE minerals abundant in the South are those needed to develop and maintain long-lived and diversified industries upon which may be founded a well-balanced, prosperous economy. The 16 Southern States and the District of Columbia can supply virtually all the most important raw materials for chemicals and other process industries as well as necessary building materials.

The true role of mineral resources in upbuilding a permanent economy is frequently overlooked. Many think of mining chiefly as the winning of metals and other high-priced substances from the earth. There is glamor to a gold rush; the discovery of a single handful of diamonds may enrich an individual; and the operation of bonanza metal mines causes boom camps to spring up in a desert. High-priced substances, however, are likely to be carried away to distant places and are often minor elements in consuming industries. Even when they improve greatly the properties of a product or constitute essential ingredients in a process, they seldom exert a dominant influence on the choice of a plant site, for they can be delivered almost anywhere without transportation adding unduly to their cost. Ghost towns in many of the older mining districts bear mute testimony to the plight of any community that owes its unstable existence mainly to mines that at some relatively early date will be exhausted or at least will fail to yield minerals that can be shipped profitably to far-away markets. The 1940 census is expected to show dwindling population in many mining areas of our Western States for this reason. Not only are the miners moving away, but the storekeepers and farmers as well, simply because local manufacturing industries have not been developed around the mines. It should be noted that many minerals are not of a sort that encourage local manufacture either by themselves or in conjunction with other raw materials available near by.

In sharp contrast with the precarious course of a mining boom is the steady advance of the process industries. These industries, which are characteristically able to use relatively cheap and abundant raw materials, have forged ahead during boom and depression alike for a third of a century. Large sectors of the chemical industry of today did not exist even a decade ago. Instead of merely furnishing fertilizers and industrial chemicals, the process industries of today supply such varied raw materials for industry as textile fibers, plastics, synthetic rubber, artificial leather, felt, and other commodities that are better and not infrequently even cheaper than competitive products. It is no mere coincidence that pioneer plants for producing so many of these new materials have been established in the South, which not only has the necessary minerals but also has them in strategic situations with respect to other natural advantages.

Ranking first among the mineral raw materials as a prerequisite for process industries is water. Most of the Southern

States have ample water resources, owing to their many large rivers and abundant year-round rainfall. Next in variety of uses is air; then in order<sup>3</sup> follow coal, sulfur, salt, limestone, petroleum, natural gas, nitrates, potash, gypsum, lead, and sand. As nitrates can be made from the air (with the aid of cheap electricity) or from coal, it may be shown that all these basic materials, with the possible exception of potash, are available in the South at least as cheaply as anywhere.

In the accompanying table, which shows the relative importance of the South in production of 15 specified mineral commodities, a striking feature is the fact that while the total value of the mineral output of the United States as reported by the Bureau of Mines was a little less in 1937 than it was in 1929, the total for the South alone increased. The South has almost exactly one-third of the population of the country, and by 1929 its contribution to the total mineral production had not quite reached its per-capita proportion; in 1937 it was much higher. Of further significance is the fact that the South increased its percentage contributions in respect to the national totals for all the fuels, salt, lime, and leading building materials. The South has a virtual monopoly of phosphate supplies that are convenient to markets, and the utility of the Tennessee phosphates has been enhanced further by the availability of ample hydroelectric power. The region produces virtually all the sulfur and bauxite mined in the United States and leads in the production of clay, feldspar, mica, bromine, and a variety of products.

However, few persons realize how little minerals are worth as they leave the ground compared with their importance in industry and their contributions to our general comfort and well-being. In only two years has the Bureau of Mines reported a value of over six billion dollars for the mineral output of the entire United States, and even this total includes values for pig iron, refined nonferrous metals, cement, and a few other products that have been manufactured further after mining. This figure seems small indeed against a 60-billion-dollar annual value for manufactured products for which minerals are essential. Only two percent of those gainfully employed are on mining-industry payrolls, yet minerals afford the main basis of employment for the major part of the 14 million workers in American factories.

Using raw materials costing only half a billion dollars a year—of which \$350,000,000 comes from mines and \$150,000,000 from farms and forests—the chemical industry employs a quarter million workers and sells almost 3 billion dollars worth of products, most of which in turn are manufactured further in other industries, thus affording opportunities for still more employment. A ton of steel made from \$5 worth of iron ore and \$2 worth of mineral fuel and flux costs \$40 before it leaves the mill as merchant bars or other shapes. Fabricated into an automobile its worth rises to around \$500; and if all

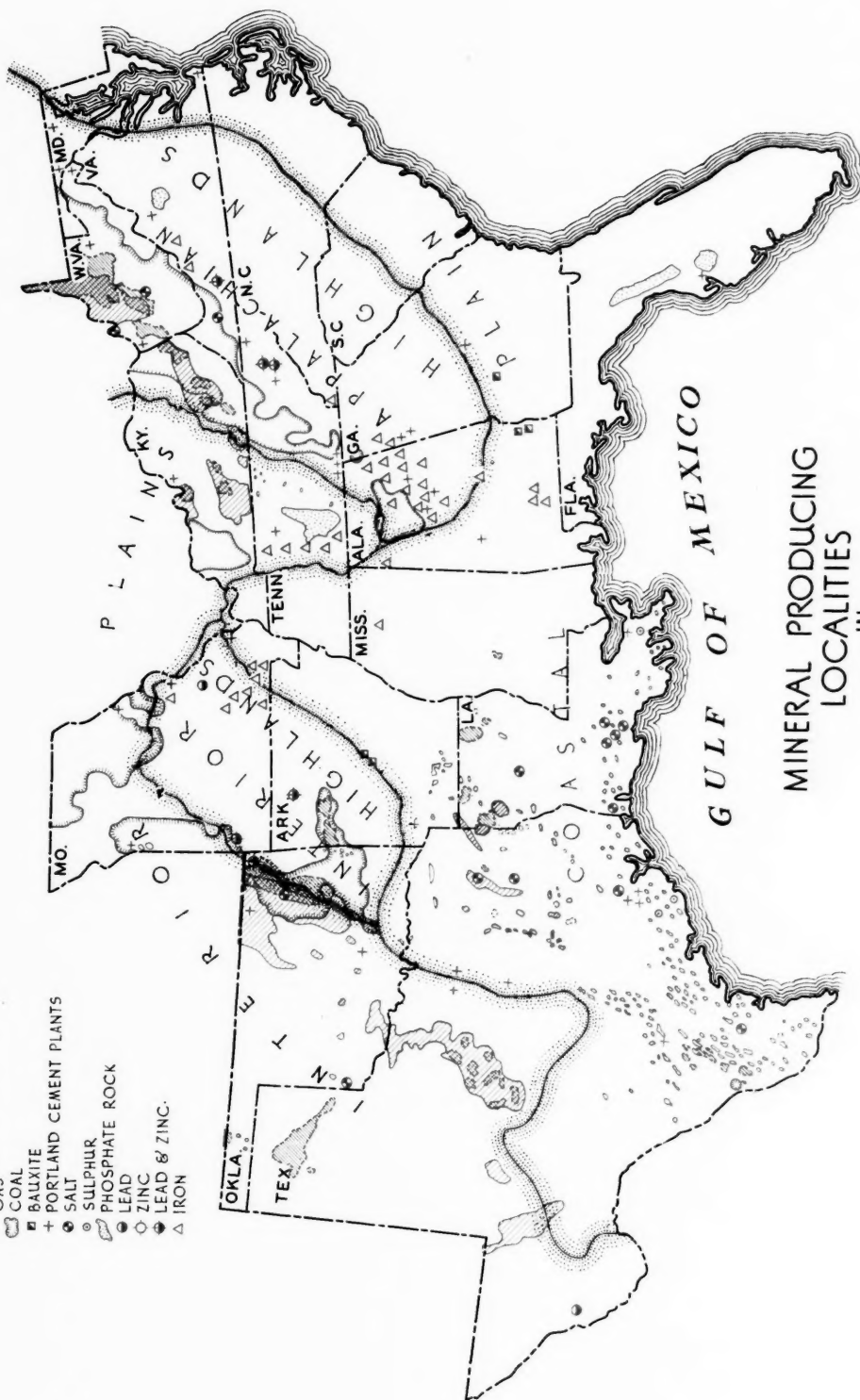
<sup>1</sup>Published by permission of the Acting Director, Bureau of Mines, U. S. Department of the Interior.

<sup>2</sup>Chief engineer, Nonmetal Economics Division, Bureau of Mines.

<sup>3</sup>Keller, R. N., and Quirke, T. T., *Mineral Resources of the Chemical Industries: Economic Geology*, May 1939, p. 294.

# LEGEND

- PETROLEUM PROD. AREA
- GAS
- COAL
- BAUXITE
- PORTLAND CEMENT PLANTS
- SALT
- SULPHUR
- PHOSPHATE ROCK
- LEAD
- ZINC
- LEAD & ZINC
- IRON



## MINERAL PRODUCING LOCALITIES IN THE SOUTHERN STATES

From Mineral Production in the South by George C. Branner, Manufacturers Record, November, 1939



*Sulphur is one of the South's most important minerals. Here is the power and water treating plant of the Texas Gulf Sulphur Company at Newgulf, Texas. In the foreground are machine shops, laboratories, warehouses and offices. In the right background are four sulphur vats. Midway between the power plant and the sulphur vats is the "bleed water" treating plant.*

of it was made into a ton of watch springs, the materials for which the miners get \$7 would fetch 2 billion dollars.

Hewitt Wilson, of the Bureau of Mines, pointed out in a paper at the February 1940 meeting of the American Institute of Mining and Metallurgical Engineers that instead of shipping only 2½ million dollars worth of raw materials—prepared china clay, ball clay, feldspar, flint, and pyrophyllite—the South might produce a large part of its per capita share (in other words one-third) of the national output of 40 million to 100 million dollars worth of pottery a year plus imports worth (at American delivered prices) almost half again as much. At Norris Dam, Tenn., Wilson has directed the Bureau's research into making this idea practical, using not only standard raw materials but other materials such as alaskite which, though abundant locally, are not now utilized even for shipment to potteries in Trenton, N. J., and East Liverpool, Ohio.

One of the fastest-growing industries is the manufacture of synthetic resins and plastics, those made from coal tar derivatives (phenol or phthalic anhydride) showing more than a fivefold increase and the non-coal-tar resins more than a tenfold increase in production during the 5-year period 1932-37. Among the latest developments in this expanding field are nylon and the vinyl resins. Nylon—which may take away from imported worm silk much of the stocking trade and from imported hog bristles the high-grade brush business—is made from coal, water, and air. Vinylite fiber is made from a resin produced from natural gas (or coal), water, air, and salt. Coal (or oil), limestone, and salt are the ingredients of synthetic rubber—better though not yet as cheap as natural rubber. Still growing are the industries making viscose rayons and cellulose film from vegetable fiber processed with chemicals derived from salt, sulfur, and cargon. Acetate artificial silk likewise is an expanding industry now that it has been cheapened by the synthetic production of acetic acid from

limestone and carbon.

Other examples might be cited to prove that modern chemists fashion new molecules so readily that exotic substances of either vegetable or mineral origin henceforth will be needed less and less. One after another of our most useful materials are being duplicated or simulated by recombining the elements of the simplest and most abundant mineral raw materials. The South is peculiarly fortunate in having a variety of essential raw materials suitably situated in respect to one another and to growing markets.

The world's largest mineral deposit is the ocean, which contains per cubic mile some 128,300,000 tons of common salt (sodium chloride), 18,000,000 tons of magnesium chloride, 7,800,000 tons of magnesium sulfate, 5,900,000 tons of calcium sulfate, 4,100,000 tons of potassium sulfate, 600,000 tons of calcium carbonate, and 360,000 tons of magnesium bromide, plus a host of minor constituents. Hundreds of thousands of tons of ocean water are pumped annually through the plant of the Ethyl-Dow Chemical Co. near Wilmington, N. C., to supply the bromine used in making tetraethyl lead compounds for antiknock motor fuels. Seeking a new source of metallic magnesium, the Dow Chemical Co. is building a plant at Freeport, Tex., to extract this element from the waters of the Gulf. Sea water would be utilized even more generally were it not for the fact that rock-salt deposits rim the Gulf in Louisiana and Texas and common salt and other saline minerals are found in much more concentrated brines or beds in other parts of Texas and in Oklahoma, Virginia, and West Virginia.

About 90 percent of the work in the United States today is done by mechanical as opposed to human or animal labor—a little less than two-thirds by coal, about one-third by oil and gas, and say five percent by water power. These figures are for the nation as a whole and may vary a little in the South, but they illustrate the tremendous value of the South's well-dis-





# 6 BASIC NEEDS

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**T**O enterprises planning to move, expand or decentralize, Chesapeake and Ohio territory offers all the basic factors of economic, strategic location. This region—Virginia, West Virginia,

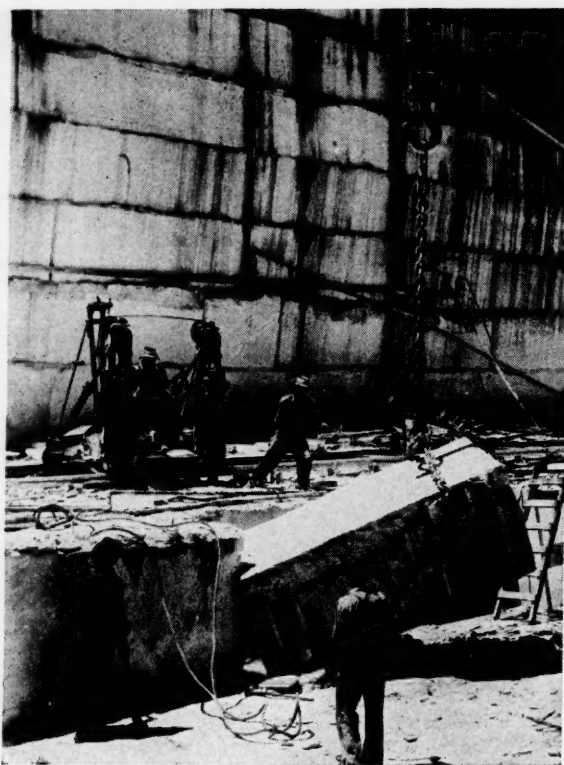
Kentucky, Ohio and Indiana — also meets many of the special requirements of various industries . . . combining with the fundamentals to make this a region rich in opportunities.

- 1 PLENTIFUL RAW MATERIALS** near at hand, may be economically secured. This area contains the country's greatest deposits of bituminous coals, to serve every industrial purpose. Natural gas and oil are readily available. Here, too, are great resources in glass sand, fire and ceramic clays, salt brine, limestone and sandstone, timber, iron ores, pure water, and agricultural products.
- 2 SKILLED NATIVE-BORN LABOR** as well as unskilled, both black and white, is abundant. The typical worker is native-born, self-respecting, proud of his home, family, job and community . . . and especially adaptable to the metallurgical, chemical, paper, ceramic, food-processing, textile and heavy-duty industries.
- 3 QUICKLY ACCESSIBLE MARKETS** make this territory a low-cost center of distribution to an area containing most of the major markets east of the Mississippi. From the middle of Chesapeake and Ohio's main line, New York is only 50 hours away by fast schedule freight. Boston, 72 hours; Louisville, 18 hours; Cincinnati, 12 hours; Detroit, 26 hours; Chicago, 33 hours. The port of Newport News, 27 hours . . . with second or third morning delivery in southern territory.
- 4 EXCELLENT TRANSPORTATION** is furnished by Chesapeake and Ohio Lines. This "Road that Service Built" has an enviable reputation for dependability, adherence to published freight schedules and wholehearted cooperation with shippers. Its close-working arrangements with other lines at strategic junction points brings Chesapeake and Ohio territory within first to third morning delivery of a market area containing approximately 70% of the United States population.
- 5 UNLIMITED LOW-COST POWER** is available in this region. Fuel in the form of bituminous coal, oil and natural gas is abundant and cheaply secured. Steam-electric and hydro-electric power are supplied in unlimited quantity at exceptionally low rates.
- 6 COOPERATIVE LEGISLATION** may be depended on, for Industry is king in Chesapeake and Ohio territory. The legislatures of the five great states in which it lies are friendly toward the needs and aims of enterprises they invite and those they already have.



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## CHESAPEAKE AND OHIO LINES



Using hydraulic drills, huge blocks of marble are cut and hoisted clear before being cut to size and polished. Quarry scene at the Georgia Marble Company, Tate, Georgia.

tributed resources in fuels and its more localized hydroelectric power. Although oil, coal, natural gas, limestone, salt, sulfur, and some of the more abundant nonmetallic minerals may play a larger part in the industrial development of the future, the South has other minerals and ores that are locally im-

portant.

The raw materials for making pig iron, for example, are abundant and cost less in Alabama than at any northern furnace; the growth of the iron and steel industry in that State and near Baltimore (where a seaboard location favors the use of imported ores) seems limited only by demand in their respective markets. Oklahoma and Missouri are leading mining States for zinc and lead, and these metals are mined also in Tennessee, Virginia, and other Southern States. Copper mining is an important industry in Tennessee and North Carolina and in the aggregate a good deal of bullion has come from mines in the gold belt that extends from Maryland into Alabama. Manganese is mined locally in Arkansas, Alabama, Georgia, Tennessee, Virginia, and elsewhere, and titanium minerals are a source of revenue in Virginia and Arkansas. The South is the only source of domestic bauxite, about three-fourths of which is used for making abrasives and chemicals. One of the largest aluminum-reduction plants is at Alcoa, Tenn., but this plant and the one at Badin, N. C., were established in the South primarily because of cheap power. Aluminum is made in this country mostly from South American bauxite, which is processed chemically at Mobile, Ala., and East St. Louis, Ill., before shipment to reduction plants. Ferro-alloy plants have been built in Alabama, Virginia, West Virginia, and Tennessee but here again because electricity or fuel is a more important cost item than freight on either metallic raw materials or the steel making alloys themselves.

The value of the mineral output of the South passed the 2-billion-dollar mark in 1937 and undoubtedly will grow further. This total includes the value not only of mineral products previously mentioned but of many minor nonmetallic minerals, such as mica, feldspar, barite, fluor spar, kyanite, vermiculite, olivine, asbestos, graphite, diatomite, lithium minerals, talc and soapstone, pyrites, and gypsum, in addition to larger items like phosphate rock and clays, but the purpose of the present discussion is to point out that the minerals that may in the future contribute most to the industrial development of the South are those that are so common there that they have far too often been virtually overlooked.

#### VALUE OF MINERAL PRODUCTS OF THE SOUTH AND OF THE UNITED STATES

	1929			1937		
	United States Dollars	The South Dollars	% of U. S.	United States Dollars	The South Dollars	% of U. S.
Petroleum .....	1,280,417,000	768,080,000	59.9	1,531,340,000	1,016,260,000	67.2
Bituminous coal .....	952,781,000	409,202,000	42.9	864,042,000	398,443,000	46.1
Natural gas .....	413,276,000	234,130,700	56.7	528,354,000	304,913,000	57.7
Clay products .....	373,409,391	78,652,743	21.1	<sup>1</sup> 256,374,176	<sup>1</sup> 67,700,000	26.4
Cement .....	255,104,506	52,227,861	20.5	171,414,093	43,778,625	25.5
Stone and slate .....	213,937,940	49,410,668	23.1	146,213,128	39,090,251	26.7
Iron Ore .....	197,148,640	13,754,182	7.0	207,828,213	10,931,358	5.3
Natural gasoline .....	158,410,000	82,527,000	52.1	97,125,000	52,388,000	53.9
Sand-gravel, cherts .....	133,377,579	31,626,820	23.7	98,097,108	21,808,461	22.2
Lead (smelter value) .....	84,735,000	31,213,850	36.9	52,291,000	22,773,410	43.6
Zinc (smelter value) .....	80,802,000	32,164,976	39.8	71,651,000	27,568,060	38.5
Sulfur .....	43,811,000	43,811,000	100.0	44,300,000	44,251,113	100.0
Lime .....	33,478,848	9,238,865	27.7	30,091,168	8,446,766	28.1
Salt .....	27,334,695	2,888,324	10.6	24,131,733	4,342,129	18.0
Phosphate rock .....	13,153,259	12,998,178	98.8	12,975,268	12,486,093	96.2
All other .....	1,626,422,000	35,426,000	2.2	1,442,528,000	32,766,000	2.3
Total .....	5,887,600,000	1,887,354,000	32.1	15,560,755,000	12,107,945,000	37.9

<sup>1</sup>Clay products statistics calculated on same basis as in 1929, thus differing from Bureau of Mines figures which in recent years report value of only raw materials used in certain clay products.

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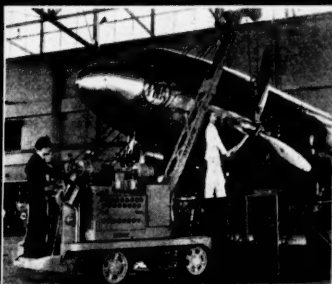
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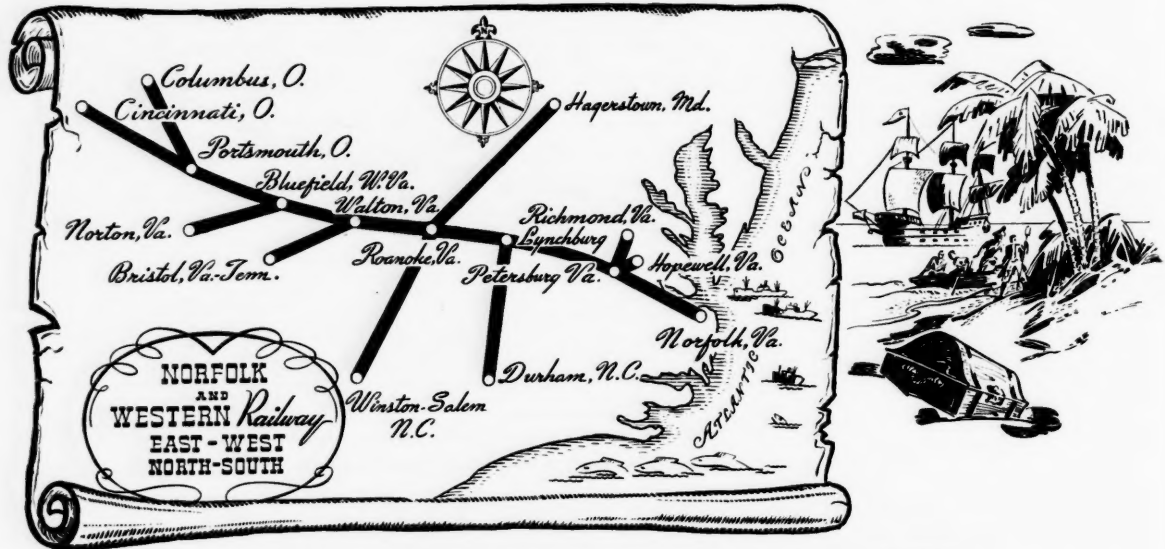
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First—the territory traversed by this railroad has an abundance of natural resources and raw materials. For example, an abundance of the three basic elements necessary to the chemical industry; an abundance of resources for the manufacture of paper products; for the manufacture of finished textiles; for the furniture, veneer and wood-working industry; for the metal-working industry; for the manufacture of dairy products; for the horticultural, meat packing and livestock industries. And along the railroad's lines there is a vast supply of fine bituminous coal for industrial fuel and for domestic and by-product uses.

Second—in the territory served by the Norfolk and Western Railway, there is adequate electric power and water; the tax rates are fair and advantageous to industry. There is sufficient room for quick, economical expansion. There is an abundance of intelligent labor. Living costs are reasonable. Climate is equable.

Third—the Norfolk and Western provides industry with adequate, efficient, dependable transportation service. The railroad is strategically located, with lines and connections running north, south, east and west to the great consuming markets of the country. The N. & W. serves an area that extends westward from the world-famous Port of Norfolk, on the Atlantic Coast, through the heart of Virginia, through the vast coal fields of southwestern Virginia, southern West Virginia and eastern Kentucky, and thence into the Ohio River Valley to the Middle West at Columbus and Cincinnati. Other N. & W. lines run north through the beautiful Shenandoah Valley of Virginia to Hagerstown, Md., south to Winston-Salem and Durham, N. C., and southwest to Bristol, Va.

At Roanoke, Va., the Norfolk and Western maintains an efficient Industrial and Agricultural Department, staffed by experts. They know conditions in every locality and community on the railroad. They have at their fingertips complete information on natural resources, raw materials, labor supply, fuel and power, distribution and markets. This department is at your service at all times—ready and eager to cooperate with you in every way in the establishment or relocation of your plant.

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# THE SOUTH—

## With its Unequalled Facilities and Wealth of Raw Materials Offers the Greatest Opportunity for Industrial Development

**T**HE South has been recognized by the MANUFACTURERS RECORD for many years as comprising sixteen states including Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

With a total area of 969,237 square miles, the South embraces more than 32 per cent of the country's entire area. Of this, water occupies 24,147 square miles or about 2½ per cent of the total area and almost 50 per cent of the whole country's water area.

The population, estimated at 44,418,000 in 1937 has an average density of 63.08 persons per square mile exclusive of the District of Columbia; the density by state ranges from Texas' low of 22.2 to Maryland's high of 164.1 per square mile. The negro population amounting to 9,552,815 comprises nearly 25 per cent of the region's total population with the highest, 50.2 per cent in Mississippi and the lowest, 6.2 per cent in Missouri. Indians numbering nearly 120,000 are located principally in North Carolina and Oklahoma while virtually all the 698,000 Mexicans are in Texas.

### Climate

**E**XTENDING over as wide an area as the South does its climate is understandably varied but is essentially temperate and equable. On the map overleaf is indicated the average annual precipitation in inches and average winter temperature in Fahrenheit degrees. Only in limited areas is the temperature and rainfall extreme in either direction.

### Transportation

**T**HE transportation facilities of the South are among the most advantageous features this region has to offer.

Railroad mileage in the sixteen states aggregates almost 100,000 miles and few or no counties within each state are without rail transportation.

Highways within the state and county systems approximate three quarters of a million miles and more than one third, or over 250,000 miles, are all-weather surfaced over which extensive passenger and freight routes connect the small communities as well as the large cities inside and outside the South.

With 2,816 miles of general coast line, which is considerably more than half the entire country's coast line, there are more than 30 ports in the Southern states which engage in foreign trade and whose combined imports and exports, according to the U. S. Bureau of Foreign and Domestic Commerce, were valued at \$1,300,406,282 in 1938. These ports are strategically located and possess adequate modern facilities for the handling of a vast number of commodities. In addition there are numerous other ports engaged in coast wise traffic. Complementing the ocean ports is another important factor in the South's transportation facilities, i. e., the great network of navigable waterways extending throughout every one of the sixteen states and greater by far than any other group of states in the country. Altogether, the waterway traffic of the Southern states including foreign imports and exports, coastwise commerce, and river, canal and connecting channel traffic but excluding ferry traffic, amounted to nearly 350,000,000 tons, valued at approximately \$8,500,000,000.

Finally, with 718 airports the South is traversed by more than 20 commercial air routes operated by 11 different companies exclusive of one company which operates to Bermuda, Latin and South America, and Europe. These services provide rapid and direct communication between the South and all other parts of the country.

### Manufactures and Finance

**T**HE total value of the South's manufactured products in 1937, the latest year for which statistics are available, was \$11,454,794,098 representing an increase of \$2,986,578,380 over the \$8,468,215,718 value in 1935, a gain of approximately 35 per cent.

Of the 23 industries each having an output in excess of one hundred million dollars, petroleum refining occupied first place with \$1,003,197,624. Other outstanding manufactures included: cotton manufactures, \$931,686,877; cigarettes and tobacco, \$878,406,556; meat and poultry packing, \$446,289,937; lumber and timber products, \$332,919,812; printing and publishing, \$313,233,031; bread and bakery products, \$258,776,315; flour and grain mill products, \$242,793,442; men's and boys' clothing, \$237,441,500; cottonseed oil cake and meal, \$224,225,320; machinery and machine shop products including tools (not electric), \$210,894,359; rayon manufactures (excluding pulp), \$172,272,433; dairy products, \$170,187,828; chemicals not separately classified, \$168,837,459; boots and shoes (not rubber), \$167,523,473; furniture, store, and office fixtures, \$141,624,472; fertilizers, \$134,669,489; non-alcoholic beverages, \$132,847,948; alcoholic beverages, \$132,422,808.

The cost of materials, fuel, electric energy and contract work used in the South's manufacturing totaled \$7,230,455,903 while the 1,800,405 wage earners had a payroll of \$1,565,545,722. The number of establishments with an annual output exceeding \$5,000, totaled 34,946 in 1937, an increase of 803 over the 1935 number compared with a decline of 3,120 establishments for the rest of the country during the same period.

The 4,913 Southern banks reporting to the Comptroller of the Currency on June 30, 1939, had aggregate resources totaling \$10,332,877,000 and individual deposits of \$9,107,445,000 while the capital stock amounted to \$589,709,000. Bank transactions of the 73 clearing house exchanges were \$38,293,578,000 and savings deposits were \$2,365,570,000.

Federal tax receipts for the calendar year 1939 amounted to \$1,340,624,460 of which corporation income tax accounted for \$175,603,558.

### Agriculture

**T**HE South's cash farm income in 1939 of \$2,763,019,000 included \$1,376,483,000 for crops from 117,203,300 acres and \$1,004,786,000 from livestock and livestock products.

Cotton comprises the South's principal crop and 11,029,000 bales from 23,301,000 acres in 13 states yielded a cash income of \$484,603,000 in 1939 while 4,900,000 tons of cottonseed added an additional \$75,612,000. Other important crops with their cash income in 1939 were: 1,624,069,000 pounds of tobacco, \$244,503,000; 67,126,000 bushels of sweet potatoes, \$19,727,400; 5,798,000 tons of sugar cane for sugar, \$16,511,000; 43,305,000 bushels of rice, \$28,767,000; 1,770,290,000 pounds of peanuts, \$34,086,000; 656,783,000 bushels of corn, \$39,702,000; 152,229,000 bushels of wheat, \$78,397,000; 133,788,000 bushels of oats, \$5,568,000; and 20,878,000 bushels of peaches, \$16,538,000. The total estimated income from commercial and non-commercial truck crops was \$107,095,000.

The number of livestock in the South in 1939 was 65,379,000 valued at \$1,567,119,000. Making up this total was 23,579,000 cattle valued at \$722,762,000 including 7,969,000 cows and heifers kept for milk and worth \$326,921,000; 15,255,000 sheep with a value of \$81,598,000; 19,955,000 swine valued at \$118,147,000; 2,867,000 horses valued at \$206,016,000; and 3,723,000 mules worth \$438,596,000. Cash farm income from dairy produce amounting to \$402,617,000 included \$243,612,000

# THE SOUTH

Its principal raw materials and transportation facilities, with facts on the reverse side pertaining to its industrial growth and opportunities for industry.

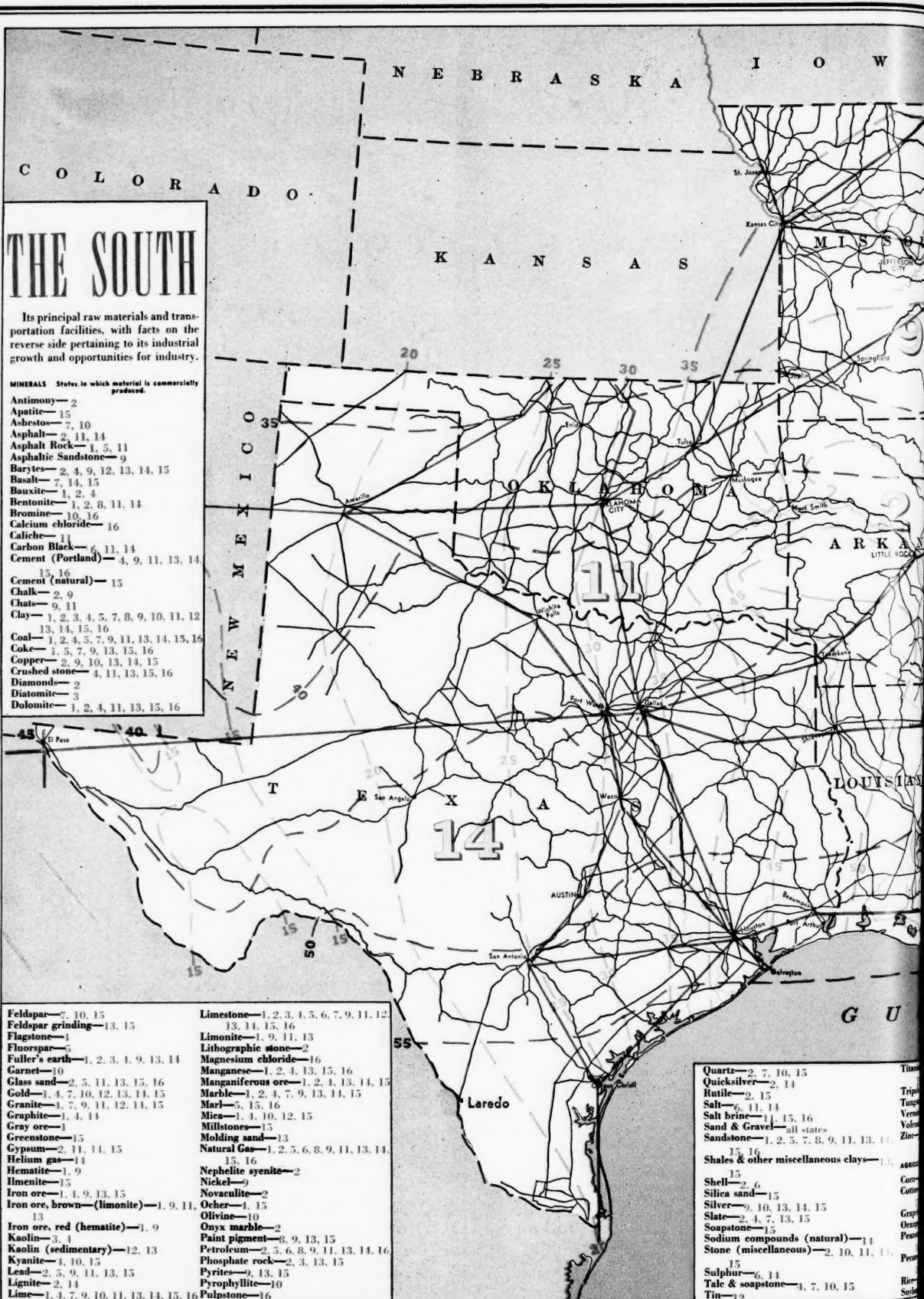
**MINERALS** States in which material is commercially produced.

- Antimony—2
- Apatite—15
- Asbestos—7, 10
- Asphalt—2, 11, 14
- Asphalt Rock—1, 5, 11
- Asphaltic Sandstone—9
- Barytes—2, 4, 9, 12, 13, 14, 15
- Basalt—7, 14, 15
- Bauxite—1, 2, 4
- Bentonite—1, 2, 8, 11, 14
- Bromine—10, 16
- Calcium chloride—16
- Caliche—11
- Carbon Black—6, 11, 14
- Cement (Portland)—4, 9, 11, 13, 14, 15, 16
- Cement (natural)—15
- Chalk—2, 9
- Chats—9, 11
- Clay—1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16
- Coal—1, 2, 4, 5, 7, 9, 11, 13, 14, 15, 16
- Coke—1, 5, 7, 9, 13, 15, 16
- Copper—2, 9, 10, 13, 14, 15
- Crushed stone—4, 11, 13, 15, 16
- Diamonds—2
- Diatomite—3
- Dolomite—1, 2, 4, 11, 13, 15, 16

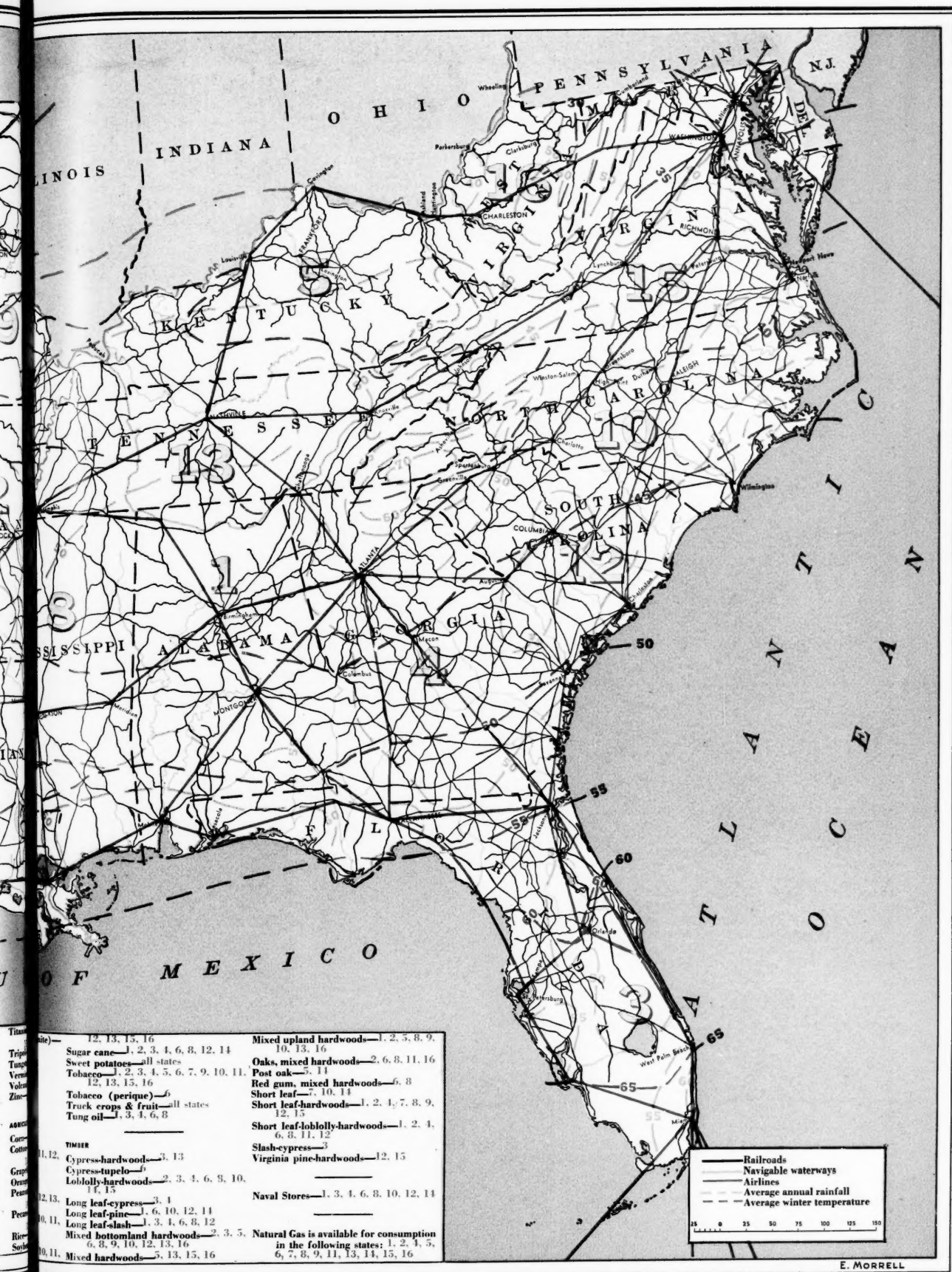
- Feldspar—7, 10, 15
- Feldspar grinding—13, 15
- Flagstone—1
- Fluorspar—5
- Fuller's earth—1, 2, 3, 1, 9, 13, 14
- Garnet—10
- Glass sand—2, 5, 11, 13, 15, 16
- Gold—1, 4, 7, 10, 12, 13, 14, 15
- Granite—1, 7, 9, 11, 12, 14, 15
- Graphite—1, 4, 14
- Gray ore—1
- Greentone—15
- Gypsum—2, 11, 14, 15
- Helium gas—14
- Hematite—1, 9
- Ilmenite—15
- Iron ore—1, 4, 9, 13, 15
- Iron ore, brown (limonite)—1, 9, 11, 13
- Iron ore, red (hematite)—1, 9
- Kaolin—3, 4
- Kaolin (sedimentary)—12, 13
- Kyanite—1, 10, 15
- Lead—2, 5, 9, 11, 13, 15
- Lignite—2, 14
- Lime—1, 4, 7, 9, 10, 11, 13, 14, 15, 16

- Limestone—1, 2, 3, 4, 5, 6, 7, 9, 11, 12, 13, 14, 15, 16
- Limonite—1, 9, 11, 13
- Lithographic stone—2
- Magnesium chloride—16
- Manganese—1, 2, 4, 13, 15, 16
- Manganiferous ore—1, 2, 4, 13, 14, 15
- Marble—1, 2, 4, 7, 9, 13, 14, 15
- Marl—5, 15, 16
- Mica—1, 4, 10, 12, 15
- Millstones—15
- Molding sand—13
- Natural Gas—1, 2, 5, 6, 8, 9, 11, 13, 14, 15, 16
- Nephelite syenite—2
- Nickel—9
- Novaculite—2
- Ocher—1, 15
- Olivine—10
- Onyx marble—2
- Paint pigment—8, 9, 13, 15
- Petroleum—2, 3, 6, 8, 9, 11, 13, 14, 16
- Phosphate rock—2, 3, 13, 15
- Pyrites—9, 13, 15
- Pyrophyllite—10
- Pulpstone—16

- Quartz—2, 7, 10, 15
- Quicksilver—2, 14
- Rutile—2, 15
- Salt—6, 11, 14
- Salt brine—1, 15, 16
- Sand & Gravel—all states
- Sandstone—1, 2, 5, 7, 8, 9, 11, 13, 14, 15, 16
- Shales & other miscellaneous clays—1, 15
- Shell—2, 6
- Silica sand—15
- Silver—9, 10, 13, 14, 15
- Slate—2, 4, 7, 13, 15
- Soapstone—15
- Sodium compounds (natural)—11
- Stone (miscellaneous)—2, 10, 11, 14
- Sulphur—6, 11
- Talc & soapstone—4, 7, 10, 15
- Tin—12







from milk, \$101,001,000 from eggs, and \$58,004,000 from chickens. Factory production of dairy products in 1938 included 305,466,000 pounds of evaporated milk, 62,362,000 pounds of condensed milk, 49,794,000 pounds of powdered milk, 96,441,000 pounds of cheese, and 265,228,000 pounds of butter.

Among additional crops grown in the South of value for industrial conversion or processing are grapefruit, oranges, pecans, tung nuts, castor beans, soy beans, and flax.

## Fisheries

**E**VERY one of the South's ten coastal states have important commercial fisheries whose combined catch in 1937 amounted to 838,995,400 pounds valued at \$20,587,604. The canned product and by-product values were \$10,679,432 and \$5,134,619 respectively while the principal species caught were oysters, shrimps, crabs and menhaden in the waters adjoining these states' tidal shore line of 8,125 miles.

## Timber and Naval Stores

**T**HE land area of that part of the South which is regarded as a timber region totals 465,143,000 acres, and of this, forest land occupies 210,600,000\* acres. However, not all this area is productive. Commercial forest land is confined to 217,031,000 acres with a sawtimber area of 100,340,000 acres—25,125,000\* acres old growth, and 71,565,000\* acres second growth—plus a cordwood area of 51,960,000 acres.

The stand of sawtimber amounting to 401,970,000,000 board feet comprises 214,630,000,000\* board feet of softwoods and 171,940,000,000\* board feet of hardwoods. Of the softwoods, 54,800,000,000\* board feet are old growth and 159,830,000,000\* board feet are second growth, while the hardwoods include 78,625,000,000\* board feet old growth and 93,315,000,000\* board feet second growth.

Southern pines account for more than 196,000,000,000\* board feet of the softwood sawtimber stand. Other softwoods include 11,405,000,000\* board feet of cypress, 2,180,000,000\* board feet of hemlock and almost 5,000,000,000\* board feet of miscellaneous softwoods. Among hardwoods, oaks predominate with more than 65,000,000,000\* board feet; red gum totals 27,405,000,000\* board feet; tupelo and black gum, 20,360,000,000\* board feet; yellow poplar, 9,190,000,000\* board feet; and mixed hardwoods closely approximate 50,000,000,000\* board feet.

On the cordwood area alone is an estimated 187,560,000\* cords—63,105,000\* cords of softwood and 125,455,000\* cords of hardwoods. But in the sawtimber area are 646,740,000\* cords, including 207,805,000\* cords of softwood and 438,935,000\* cords of hardwood. Together these total 834,300,000\* cords, and if 15,850,000 cords on restocking areas and 278,775,000 cords of cull trees are added the full total of timber in the South exceeds 1,210,000,000 cords.

The total lumber sawed in 1938 by 9,661 active mills amounted to 10,090,837 million board feet of which 7,687,439 million board feet was softwood and 2,403,398 million board feet was hardwood. Employed in the South's 4,287 lumber industry establishments in 1937 were 167,759 wage earners with a payroll of \$93,025,745 and the products were valued at \$335,099,812.

Among the most important forest industries is the production of naval stores which is limited to the eight most southern states and produced 382,781 fifty-gallon barrels of gum turpentine and 221,997 fifty-gallon barrels of wood turpentine or a total of 604,778 fifty-gallon barrels of turpentine and 2,293,971 five-hundred-pound barrels of rosin (1,317,795 and 976,176 barrels respectively of gum and wood rosin) during the 1939-1940 season.

## Mining and Minerals

**T**HOUGH the value of mineral production in the South has increased at an almost phenomenal rate during the past 25 years and now comprises nearly half the value for the entire country, these figures in themselves do not adequately portray the mineral situation of this region. The aggregate value of the South's mineral production in 1937 (the latest year for which such figures are available) was \$2,066,933,227 but of this, non-metallic minerals including fuel minerals, which are usually of lower value than metals, comprised the major part.

Approximately half the nation's bituminous coal is produced in the South, over 167,000,000 tons being the output in 1938. This, together with an estimated petroleum production of 767,178,000 barrels in 1939 and natural gas which reached 1,694,-

\*Includes only the eastern parts of Oklahoma and Texas where the principal commercial forest areas of those states exist.

\*Figures for Maryland and Missouri are not included since they are unavailable.

424,000,000 cubic feet in 1937 means that the South supplies about two thirds of the country's fuel requirements. Reliable estimates of commercial reserves indicate an ample supply for continuing demands throughout the years to come. Insofar as petroleum is concerned the new horizons constantly coming to light show the reserves always to be increasing. During the past year new sources have been found in Mississippi and it is anticipated that other states will come into production in the future.

On the accompanying map is indicated, by state, numbered in alphabetical order, the location of the South's commercial mineral production but in addition, there are numerous other deposits of many of these minerals which are known or believed to be of a commercial character. As exploratory surveys and analyses continue there is reason to believe that a large number of new deposits and new minerals will be located for the known varieties of the South's commercial minerals now exceed one hundred in number.

## Electric Power

**T**HE total generating capacity of the South's 1,173 public utility power plants at the beginning of 1940 was 9,619,685 kilowatts. Operated by 490 companies, this total was made up by 395 steam power plants capable of developing 5,724,856 kilowatts, 239 hydroelectric plants able to generate 3,572,338 kilowatts, and 539 internal combustion engine plants with a generating capacity of 322,491 kilowatts. As 1940 progresses, many of these plants are undergoing expansion and new ones are being constructed or are projected for the near future so that the total mentioned above will soon be enlarged considerably. In addition to these facilities, additional supplies can be obtained through the network of intercommunicating state systems.

In 1939 the production of electric power in the South amounted to 30,726,286,000 kilowatt hours including 19,561,781,000 kilowatt hours produced by fuels and 11,164,485,000 kilowatt hours produced by water power.

## Taxation

**W**ITH such a large area to cover and so many taxing authorities involved it is virtually impossible to cite here the variety and range of the different taxes to which an industrial concern might be subjected. As a general rule however, it can be definitely stated that the Southern states are fully cognizant of the desirability, if not necessity, of keeping taxes as low as possible in order to induce new industries to settle within their respective borders.

Eight of the states offer some form of tax exemption to new industries and for additions or expansions to those now located in the area.

Corporation income tax ranges from none in some states to as much as six per cent in about two states. At least one state having no income tax imposes a gross sales tax. On the other hand, some states with a higher income tax have no real estate tax.

Practically every state has a corporation franchise tax which is very similar in its graduated form and usually carries a provisional minimum of ten dollars.

Several of the mineral producing states levy a severance tax or gross production tax which varies with the commodity.

Local tax rates vary considerably from less than 50 cents; but in only a few instances do they exceed four dollars.

## Labor

**W**ITH the trend toward decentralization in industry it is important to note that the average density of population in the South is 63 per square mile and large cities were very few, according to the 1930 census—only two having a population in excess of 800,000. There were three cities whose population ranged between 400,000 and 500,000; six between 250,000 and 325,000; twelve between 100,000 and 250,000; and 25 cities between 50,000 and 100,000 population.

Preliminary and incomplete data of the 1940 census shows two cities with a population of over 800,000; three between 400,000 and 500,000; seven between 250,000 and 400,000; nine between 100,000 and 250,000; and twenty-four between 50,000 and 100,000 population.

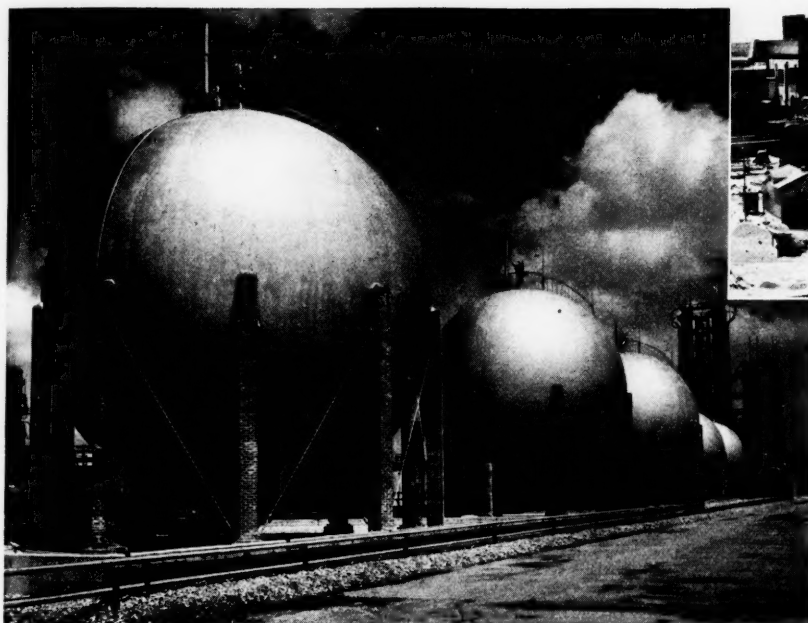
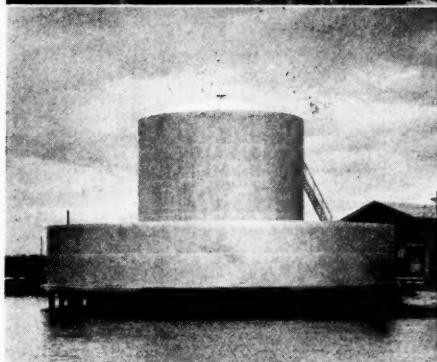
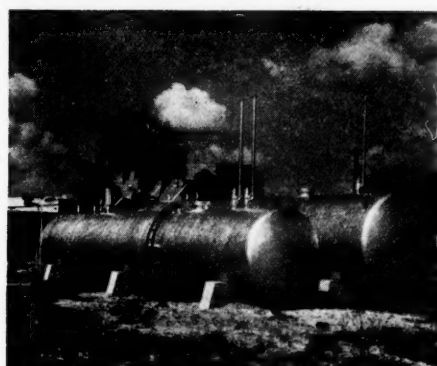
Another important factor in the labor situation is the high percentage of native white people—97.39 per cent compared to a national average of 87.7 per cent. Native whites whose parents were born in this country amount to 91.19 per cent of all whites while those of foreign parentage total only 3.63 per cent. Foreign born whites comprise only 2.61 per cent. As a result, the South's population is made up of loyal, intelligent and hardworking Americans.

# STEEL TANKS for the SOUTH'S RESOURCES

Natural resources must be developed before they are of value to mankind. The development of these resources is known as Industry, and the term applies to a wide variety of activities.

Each type of industry requires specific equipment to carry on its work. Steel tanks, in some form or other, play an important part in almost every industrial process. They include elevated water tanks, flat-bottom storage tanks for acid, caustic, fuel oil, gasoline, and other processing materials, as well as bins, digesters, diffusers, high and low pressure vessels, kilns, towers, and stacks. In addition to these more or less standard structures, new types and designs of tanks are developed whenever a new process is installed or an old one extended.

We are equipped to fabricate all kinds of tanks and steel plate work in our plant at Birmingham, Alabama, and our thoroughly experienced field crews do the erection. Write or call us for information or estimates.



► Top, 8 ft. diam. by 47 ft. and 10 ft. diam. by 47 ft. butane tanks at Sebring, Fla.

► Center, 10,000 Bbl. fuel oil tank with steel firewall at Brunswick, Ga.

► Bottom, elevated water tank used for general service at a plant in Fernandina, Fla.

► Left, general view of welded pressure spheres at Port Arthur, Texas.

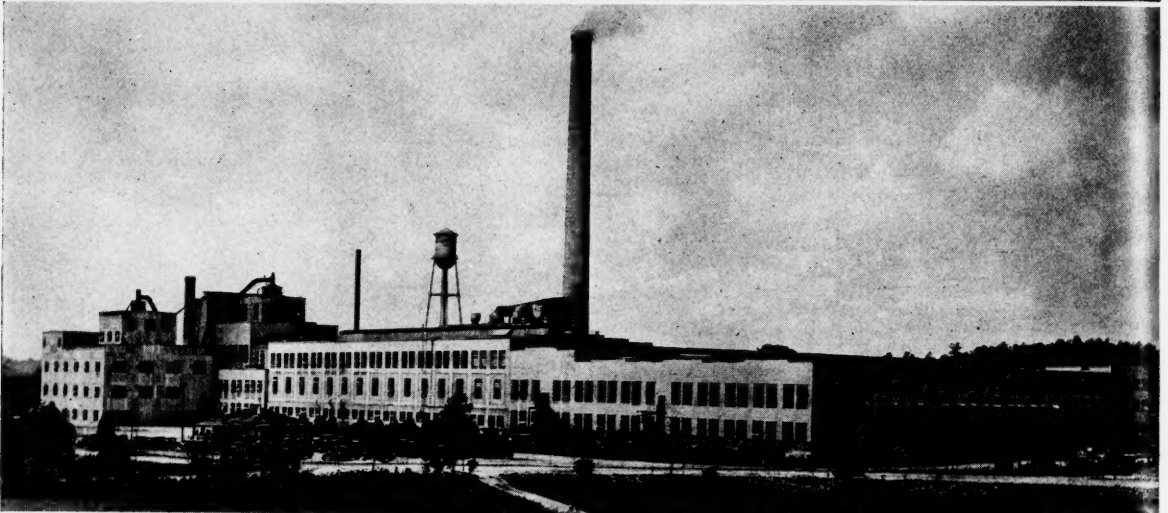
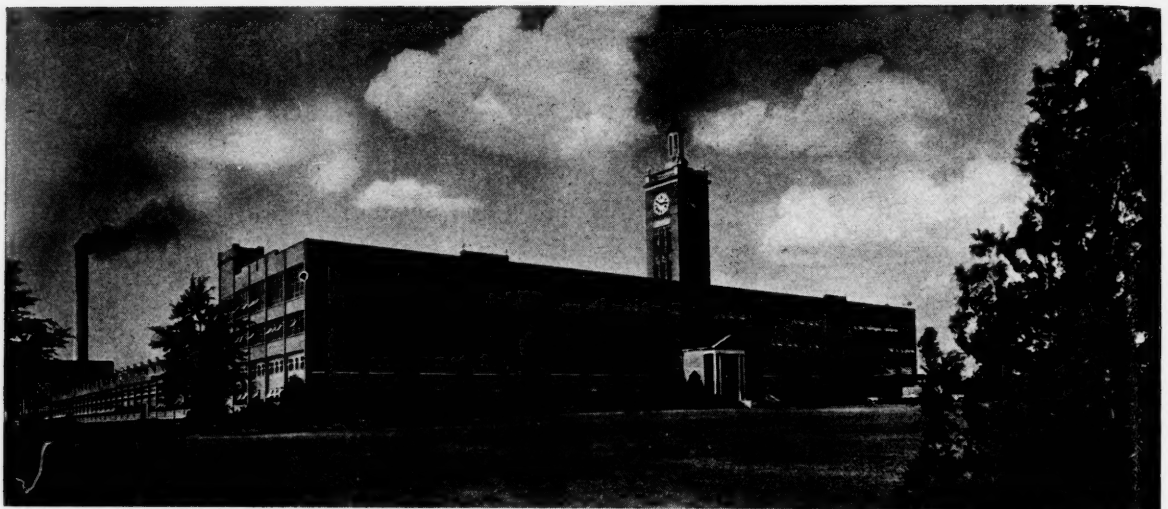
## CHICAGO BRIDGE & IRON COMPANY

Birmingham .....	1530 North Fiftieth Street	New York .....	3313-165 Broadway Bldg.	Philadelphia .....	1619-1700 Walnut Street Bldg.
Dallas .....	1608 Praetorian Bldg.	Cleveland .....	2216 Rockefeller Bldg.	Detroit .....	1510 Lafayette Bldg.
Houston .....	918 Richmond Ave.	Chicago .....	2106 McCormick Bldg.	Boston .....	1510 Consolidated Gas Bldg.
Tulsa .....	1611 Hunt Bldg.	San Francisco .....	1040 Rialto Bldg.	Havana .....	Edificio Abreu 402

Plants in BIRMINGHAM, CHICAGO and GREENVILLE, PA.

B-748





*Top—One of Alabama's newer industries is that established at Gadsden by the Goodyear Tire and Rubber Company. Center—The Gulf States Paper Company plant at Tuscaloosa is one of Alabama's largest paper plants; this and other similar plants are creating a vast market for southern pine. Bottom—Modern textile mills like this one of the West Boyston Manufacturing Company at Montgomery, are distributed over a large part of Alabama and their products are finding acceptance throughout the markets of the world.*

# ALABAMA



*The Jordan Dam of the Alabama Power Company is one unit of a series of such plants in the state which places Alabama in a prominent place among southern states in the amount of hydro-electric power produced.*

## ALABAMA, HEART OF A NEW INDUSTRIAL EMPIRE

**I**MPRESSED by the resources and opportunities of the land the early Indians named it "Alabama." Alabama in the Indian language was a very inclusive word meaning, "This is our home land. We will clear the thickets and plant our seed. Here we rest."

Today those who will carefully consider its great timber resources, extensive mineral deposits, productive soil, mild climate, and native-born citizenship will find Alabama a state of unusual opportunities for diversified agriculture, sound business and successful in-

dustry.

Alabama, like other southern states, for many years remained largely agricultural with an economy dominated by cotton. That condition has changed. Since the turn of the century industry has been gradually develop-

BY

**John M. Ward**  
*State Chamber of Commerce  
Montgomery, Ala.*

ing on a sound basis. Today the state's industrial and mining operations give employment to more than 150,000 people and the value of products manufactured and mined annually exceeds \$627,000,000.

Within the last three years (1937-1939) more than \$85,000,000 of new capital has been invested in industry in Alabama and many of its resources are still undeveloped while others are only partially developed.

Reviewing the state's industrial development, iron and steel, textiles, lumber, and



coal have led the way.

Most spectacular gains, perhaps, have been made in the iron and steel industry in the Birmingham and Gadsden districts. During the last third of a century Alabama's iron and steel industry has become one of the major production centers of the nation, challenging some of the older and more established centers of the North.

Beginning a third of a century ago, this industry in 1938 saw a total Alabama pig iron production of 2,023,268 tons and a total production of hot and cold rolled iron and steel products of 1,001,121 tons. Steel operations include rail mills, plate and structural mills, bar mills, sheet mills, wire mills, hoop mills, tin plate mill and by-product plants.

Closely following the development of the iron and steel industry proper, such industries as structural steel, coal and coal by-products, cast iron pipe, special machinery and castings, stoves, car building and others have come into prominence.

While this new iron and steel empire was being created, the textile industry began its development. First to recognize the favorable conditions existing in Alabama were spinning and weaving mills, but more and more manufacturers of finished consumers goods are finding a profitable field in this state. Recently established hosiery and garment plants have found favorable operating conditions here. Today, the textile industry in Alabama counts more than 125 units in Alabama and the value of their products exceeds \$125,000,000 annually.

The great timber resources of the state made possible the early development of the lumber industry and while it has receded somewhat from its peak operations as virgin stands of timber have been cut, the industry has found a level today where it employs 17,300 people and its products have an annual value of \$32,000,000. The timber lands of most of the larger companies are now on a sustaining yield basis.

Less spectacular but scarcely less important gains have been made in the development of the chemical, food products, meat packing, cement, lime, marble, building stone and clay products industries. All of these enterprises are steadily progressing on carefully-planned programs, and are firmly established as a part of the present industrial set-up.

Numerous other industries have made substantial gains in the last third of a century

and new industries have been added to the list within comparatively recent years. One of the most striking of these newer industries has been the manufacture of paper from Southern pine. The first commercial production of groundwood pulp from Southern pine was produced by the Mobile Paper Mill Company. In addition to this mill in Alabama today, two very large kraft paper plants are operating profitably and within a few weeks the state's first white paper mill, using Southern pine and gumwood and involving an initial capital outlay of \$5,000,000, will go into production at Mobile. Also, Alabama has a modern insulating board mill at Mobile (National Gypsum Company) which is using groundwood pulp from pine and hardwoods.

Another comparatively new industry in the State which has found all operating conditions here most favorable and which is expanding is the automobile tire and tube industry.

From these developments it can be seen that Alabama's industrialization is proceeding along sane and sound lines gradually bringing about a desired diversity of the state's industrial life.

Seeking further industrial development to bring about a better balance between agriculture and industry, Alabama offers sound opportunities to new industries.

Industrial development is not being sought at the expense of any other section, but Alabama is seeking industry that will take the raw products of farms, forests, and mines, to process and make them ready for consumer use. No short-sighted policy is being pursued in regard to industrial development. The state is interested only in those industries which will assume their full share of community and state responsibility and whose operations will be profitable. There are no resources or labor to be exploited by undesirable industry, and it is realized that the social conditions and buying of the southern people depend upon their receiving fair wages for their labor. Indeed, the purchasing power of this section is one of the ever present elements in the whole economy, dependent not only upon receiving a fair value for the product, but reasonable and fair wages to the workers. No unsound inducements or concessions are being offered in order to obtain new industry. Natural advantages in themselves constitute

sufficient inducement. This further industrial development in Alabama will increase the income of the people who will in turn be able to buy more of the products manufactured in other states as well as those produced in Alabama.

\* \* \*

The list of raw materials which Alabama has to offer is almost limitless, the state's coal, iron ore, limestone, marble, clay and sand deposits being known nationally. Not so widely known, perhaps, is the fact that thirty different minerals are found in Alabama in commercial quantity and quality.

An unusually productive soil provides many raw materials for industries at present and is capable of providing many more. Whereas in former years cotton dominated the farmlands of the state, today a wide variety of products are being produced. Sound soil conservation measures are being installed on Alabama farms and diversification of cash crops is being widely practiced.

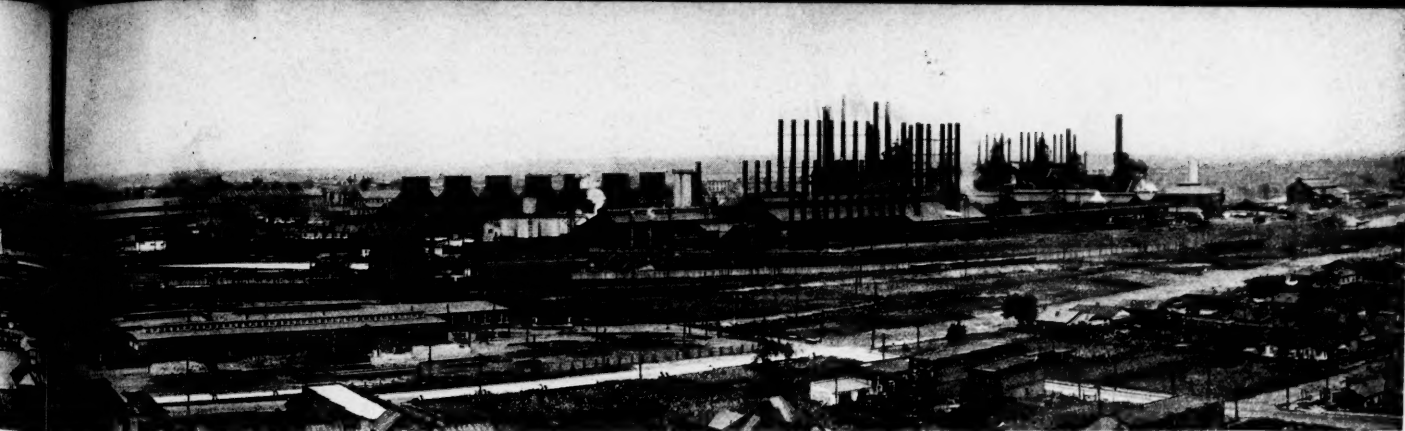
Most striking of the new agricultural developments is the livestock industry, which has grown to remarkable proportions particularly in that part of the state which formerly was considered the exclusive domain of cotton. Indicative of this trend to livestock is the fact that within the last few years Montgomery has become one of the largest livestock markets in the South, and in 1939 the stockyards of that city handled \$6,000,000 worth of livestock.

Strides have been made in dairying also, and it is believed that no section of the South has better natural advantages for this industry than are offered in certain parts of Alabama. Several milk processing plants are located over the state.

Development and proper utilization of sweet potatoes as a stock feed high in carbohydrates will give more fat or finished beef cattle and make a more productive dairy industry. Alabama produces ample proteins in cottonseed and peanut meals, produces large quantities of forage crops or hays, has excellent pastures and indications are that sweet potatoes will soon provide the needed carbohydrates for balanced livestock feed.

Quantities of Alabama strawberries move to Eastern markets each spring and several counties in the southern part of the state have become one of the major early Irish potato producing areas of the nation. Truck crops in quantity are produced in various sections and





the location of canneries or processing plants would result in still further expansion along these lines.

Peanuts have become a major cash crop in at least ten counties and a number of processing plants, including the largest peanut butter plant in the country, have been established.

Alabama's forest resources provide an important source of raw materials for manufacturing. The state's forest lands are extensive and most productive and are being conserved for future generations by enlightened state laws and sound forestry practices by private industry.

The products of existing industry present an important array of raw materials to be used by plants to further refine these products.

\* \* \*

Moderate fuel costs, as a result of a varied and adequate supply, is another natural advantage enjoyed by Alabama. Coal, coke, natural gas, by-product gas and fuel oil are all available in the state. Annual coal production averages approximately 12,000,000 tons and annual production of coke averages about 3,400,000 tons. Both are capable of substantial increase to meet future needs. By-product gas is produced in tremendous quantities in the Birmingham and Gadsden areas and natural gas is piped from the Louisiana fields and is available in adequate quantities at moderate cost.

\* \* \*

Since the infant days of commercial electricity, Alabama has taken leadership in the national power industry. The first commercial electric railway system in America was established in Montgomery in 1886. One of the first long distance transmission lines in the Eastern United States was put into service in Alabama as early as 1902. Since these early times the state has held its foremost position in the generation and distribution of electric energy; and has anticipated the markets and power needs during the decades following. Taking the lead in this power development have been the Alabama Power Company and several smaller power companies.

Today with the generating facilities of these companies and the recent development of facilities in north Alabama by the Tennessee Valley Authority, Alabama is in an enviable position with an installed generating capacity of 1,250,000 horsepower and even greater ultimate capacity.

Transmission lines gird the state and rural

*Alabama's great iron and steel industry is typified by this plant of Tennessee Coal, Iron and Railroad Company's Ensley works at Birmingham where other plants also are located as well as at Gadsden.*

electrification lines reach into remote communities. Power for industrial and commercial use is available in abundance in all sections of the state at rates conspicuously favorable in relation to those in the country-at-large.

\* \* \*

Thousands of miles of railroad trunk lines, paved highways, navigable waterways provide excellent transportation facilities for industry while airlines traverse the state to give Alabama the advantage of fast, modern transportation for concerns which can utilize this service.

Most important developments have taken place in recent years at the Port of Mobile, particularly since the construction of a system of state docks at a cost of \$12,000,000. Modern facilities for export and import, including cold storage and quick freezing plants, are available at this modern tidewater terminal. Birmingham, through the navigation development on the Tombigbee and Warrior Rivers, has an outlet to the sea through Mobile and freight traffic on the Tennessee River is increasing since completion of T. V. A. dams have made this river navigable.

Two other prospective developments offer possibilities of expanded water transportation. Under consideration now are proposals to connect the Tennessee River with the Tombigbee system and thus give a direct water route from the Tennessee Valley to Mobile by canal. Consideration is also being given to opening the Coosa River to navigation which would provide a large potential industrial area an outlet to the Gulf.

\* \* \*

Perhaps Alabama's greatest single asset is her splendid citizenship which affords an abundant supply of labor. While generally rated as unskilled, this labor has in numerous instances demonstrated its aptitude for industrial employment. Alabama working people are largely native-born, willing workers, loyal to their employers, thoroughly American in their ideals, quick to learn and capable of be-

ing developed to high productivity in many industries. Negro labor which formerly was considered useful almost solely in agriculture has been found unusually satisfactory in certain lines.

Brief reference has already been made to Alabama's labor conditions, but this subject merits further consideration. The state has always been relatively free from labor dissension and the splendid relations between employer and employee are being improved from year to year.

Reasons for these harmonious relations are to be found in the peculiar characteristics of Alabama labor, the sound policies pursued by most industries and the operation of one of the best and most modern State Departments of Industrial Relations in the nation. There is every reason to believe that these considerations will tend to promote even greater freedom from labor strife in future years.

The Alabama Legislature recently enacted a series of amendments to the State Unemployment Compensation Act which has made the Alabama law one of the best in the nation. The act is fair to all, and is another factor that contributes to good labor relations.

\* \* \*

In the matter of taxes, the State has pursued the same far-sighted policy it has attempted in other relations with industry. Existing taxes are moderate and the present State Administration, in response to public sentiment in this respect, has shown an unquestioned willingness to prevent any increases in taxation, and has placed the operation of the State government on a sound business basis.

The present trend in State Administration and the current attitude of the public indicates that Alabama government will continue to be cooperative and friendly to business and industry.

\* \* \*

For many years the State has had an outstanding Health Department and the work of this agency, coupled with a favorable climate and sane habits of living, has safeguarded the health of Alabama citizens. Perhaps in no other field is the South more misunderstood than in the matter of public health for recent studies have shown that the death rate from all diseases in the white population in Alabama is lower than for most of the Northern and Eastern states. Climatic conditions make for a healthy people and for productivity and



efficiency in industry. Any disadvantages that might have resulted from summer heat are being removed by development and use of air conditioning. Health education and public health are keeping step with the most progressive trends in the nation.

It may come somewhat as a surprise to many persons to learn that Alabama, along with the rest of the South, is today spending far more of its total income on education than any other region in the nation. Rapid progress is being made in public school education and by the

*The most up-to-date tidewater terminal facilities are available to Alabama and surrounding states industry through the port of Mobile. Pictured above are the State Docks, built at a cost of \$12,000,000 and among the finest on the Gulf Coast.*

state's institutions of high learning. A compulsory education law requires all children between the ages of seven and sixteen to attend school unless obviously disqualified.

Keeping pace with industrial and other developments is the development of recrea-

tional areas, so important in the life of any people. Along the lakes of north and central Alabama resulting from power dams, in the mountains and on the Gulf shore these areas are being made available for use. A system of State and National parks and private facilities contribute in offering to citizens increasing opportunities of recreation and in attracting tourists.

Coupled with these advantages is the keen interest of the state in the welfare of existing industry and the acquisition of new indus-

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tries. This interest is evidenced by attitude of state government, the activity of the Alabama State Chamber of Commerce, the State Planning Commission and the activity of private agencies and utilities, and the endeavors of local communities throughout the state. Thus the full cooperation of the entire state is assured to desirable industries considering an Alabama location. Financial participation on the part of the local community in a new plant is frequently possible but such participation is always on a sound business basis. Many industries are finding the smaller towns and cities of Alabama to be splendid locations for pleasant and profitable operations. There is still a large area in Alabama with little industry. Twenty-eight of the sixty-seven counties still have fewer than 500 industrial wage earners, almost virgin territory with ample available labor.

With all these resources and natural advantages there seems every reason for confidence that existing industries in the state will continue to expand and new industries will come to join them in their profitable operation. With a sound groundwork already laid, it is believed that Alabama will soon see marked development of industries which will turn out more highly finished goods for consumer use.

The state is producing iron and steel which should be manufactured into such things as stamped and pressed metal products, sheet metal articles, factory machinery and parts, tin cans, farm machinery and tools and machine tools.

The state's textile industry still has plenty of room and opportunity for dye and finishing plants, knit goods, rayon manufacture, carpets and rugs and garment factories of various types.

Farmlands of the state will produce the raw materials for more meat packing plants, leather tanning, canning factories and dairy products while forest lands are capable of supplying raw materials for furniture, wallboard, paper and cellulose products of all kinds, including possibly low cost textiles.

Hydrogenation of Alabama coal to make petroleum products is visioned as a future field for expansion of the coal industry.

Expansion of the state's chemical industry, on which a substantial beginning has already been made, offers opportunity for further development. The next quarter century will likely be a chemical one. Plant chemistry is yet in its infancy. Alabama climate and soil if properly fertilized has wide productivity. Insecticides and special fertilizers loom as future products of the state.

Large scale production of starch from sweet potatoes is indicated by recent developments.

Magnesium ranks more important year by year as a metal of the future and the state's limitless dolomite deposits and abundance of power give promise of becoming the base for a substantial industry of this type.

There is much interest in process industries and particularly in new methods of utilizing coal. Alabama's Warrior coal field has huge supplies of high grade coking coals in proxim-

ity to large quantities of water. In this field "Coal, Water and Air" are available to those recently newborn industries that were only dreams of yesterday.

Huge deposits of silica suitable for a major glass-making industry may bring this industry to Alabama and a wide variety of clays provide the foundation for a great pottery and clay products industry.

Alabama's tin ore deposits, centering in Coosa County, are now in the hands of people with ample resources to develop them, and such development is under way. The next six months should show whether or not there is a real tin field in Alabama. The United States used more than half the tin of the world last

year, but produced only sixty pounds.

Most of Alabama's resources are of such a nature that they rank large in the world of today but in the new world of tomorrow, when technological progress will have expanded the uses of the raw materials which are so abundant in the state, Alabama undoubtedly will take its place in the first-rank industrial states of the nation.

To quote Governor Frank M. Dixon, "In these last few years there has come a new hope, a new vision, to our people. We are—developing rapidly our resources, building again a heritage for our children—a new, vital, determined Alabama, with clear vision, has raised her head and faces the rising sun."

## Look At Alabama!

Are you considering the establishment of a new plant?

### Look At Alabama!

Do you require an adequate source of intelligent labor?

### Look At Alabama!

Are cheap, high-quality fuel (coal, gas, oil) and a dependable source of electric power important factors in your operation?

### Look At Alabama!

Will you need an unlimited supply of relatively pure water?

### Look At Alabama!

Are plentiful rail, water and highway transportation facilities and market accessibility important considerations?

### Look At Alabama!

Do you require a year 'round good seaport for export or import?

### Look At Alabama!

Would a pleasant, temperate climate help lower construction, production, and maintenance costs?

## Look At Alabama!

During the past decade, many industries (steel, aluminum, paper, gypsum, silk, chemical, electrical appliances, and others) have established plants in Alabama after careful consideration of advantages offered. It was our pleasure to collaborate with many of them, at their request, in the preparation of economic surveys covering specific locations in Alabama. This service is offered you.

NEW INDUSTRIES DIVISION

# ALABAMA POWER COMPANY

Birmingham, Ala.



# Alabama—

## And its Natural Resources for Further Development

**A**LABAMA, familiarly known as the "Cotton" state, was first reached by Hernando de Soto in 1540, but was never permanently settled until 1702 when Bienville, the French governor of Louisiana moved the seat of government from Biloxi to Mobile. The present site of Mobile was laid out in 1711. Fifty-two years later the territory was ceded to Great Britain, part of it being later ceded to Spain and annexed to Florida. Under the terms of the Louisiana purchase, this area was claimed by the United States and eventually organized in 1817 to become in 1819 the ninth state admitted to the Union.

Twenty-eighth in size with an area of 51,998 square miles, Alabama ranks fifteenth in population which in 1937 was estimated at 2,895,000, two-fifths being of the colored race.

### Climate

**C**LIMATICALLY, Alabama tends toward the temperate and rarely has extremes of temperature, severe cold and freezing temperatures seldom lasting more than 48 hours. Although the summers are long, day temperatures usually are not excessively high, while the nights remain comfortable even in midsummer. The average annual precipitation is about 54 inches and the average temperature approximates 63° with a monthly average ranging from 48° in January to 80° in July.

### Transportation

**R**AILWAYS cover every county and 5,128 miles of track provide a generous accommodation for both passenger and freight service between the widely scattered centers of population in the north central portion and Mobile in the far south. The highways, providing an important medium for passenger and commercial traffic, have been well developed and recent computations estimate the State system to exceed 6,500 miles of which close to 4,500 miles are surfaced.

In addition to these means of transportation, Alabama has extensive waterway arteries sufficiently developed to make conveyance of commercial products to the ocean and other ports a relatively simple matter. During 1939 the amount of tonnage carried on these waterways exceeded 2,110,000 tons, the bulk of it between the Port of Birmingham and Mobile on the Black Warrior and Tombigbee System. On the coastal line of 53 miles is situated one of the largest of the Gulf ports, Mobile. Docks have been built here with adequate facilities for an import and export trade comparable with those of north Atlantic coast ports. Mobile, connected with Pensacola by means of an intercoastal waterway, is the second port in the country to be operated under Federal license as a Foreign Trade Zone. Traffic during 1939 totaled 4,685,484 tons of which foreign imports and exports were 611,474 tons and 887,330 tons respectively. The channel approach to Mobile, which is maintained by the U. S. Engineers, has a minimum depth of 32 feet and minimum width of 300 feet while on the outer bar the channel is 36 feet deep and 450 feet wide. Berthing space is provided for 42 ships while 2,000,000 square feet of covered public warehouses augmented by a cold storage plant, fruit terminal, bulk material-handling plant and equipment for handling heavy cargo provide ample facilities for future demands.

### Manufactures and Finance

**A**LTHOUGH Alabama has been predominantly an agricultural state, the trend toward industrialization is evident from the fact that whereas in 1920 nearly 60 percent of the employed people were engaged in agriculture, the percentage fell to approximately 49 percent in 1930 and in 1937 the 120,301 wage earners employed in the state's 1,874 manufacturing establishments was 25,956 persons more than in 1935.

The value of Alabama's manufactured products, amounting to \$573,763,522 in 1937, was \$216,537,360 greater than the 1935 value of \$357,226,162, or an increase of more than 60.5 percent.

Of the 59 industries separately listed by the census reports in 1937, 39 had an annual output in excess of one million dollars each. The most outstanding industry was cotton woven goods with products valued at \$87,327,487. Other important industries with their values were: blast furnace products, \$39,629,075; lumber and timber products, \$31,915,650; cast iron pipe and fittings, \$28,104,450; coke oven products, \$23,579,609; cotton yarn and thread, \$23,245,789; and cottonseed oil, meal and cake, \$19,681,409. Eleven other industries each had an output greater than five million dollars. The cost of materials, fuel, electric energy, etc., totaled \$336,327,661 against \$210,642,246 in 1935 while the annual payroll rose from \$60,643,479 in 1935 to \$96,058,401 in 1937. During the same period the number of establishments was increased by 183.

The aggregate resources of the state's 216 banks which reported to the Comptroller of the Currency on June 30, 1939, was \$348,873,000 and the capital, including capital notes and debentures, totaled \$28,465,000. Individual deposits amounted to \$298,371,000 while savings deposits were \$94,502,000. Total bank clearings for the three reporting exchanges of Birmingham, Mobile and Montgomery was \$1,200,149,000, an increase of over ten percent beyond the 1938 figure of \$1,057,216,000.

### Agriculture

**T**HE total cash income of Alabama farmers in 1939 was \$114,863,000 including \$58,011,000 from crops grown on the state's 7,850,600 acre aggregate farm crop acreage and \$29,593,000 from livestock and livestock products.

The principal crop of cotton amounting to 780,000 bales of cotton lint from 2,037,000 acres yielded \$32,565,000 while 346,000 tons of cottonseed provided an additional \$5,025,000. Other important crops were: corn, 34,080,000 bushels; oats, 2,838,000 bushels; sweet potatoes, 8,800,000 bushels; peanuts, 267,750,000 pounds; and peaches, 1,705,000 bushels. The total estimated income from commercial and non-commercial truck crops was \$1,460,000 of which, \$587,000 came from market sales and \$26,000 from sales for manufacturing. An interesting and important development is the report of 430,000 pounds of tobacco produced during 1939 in Alabama yielding \$56,000.

Livestock in Alabama numbering 2,762,000 is valued at \$79,659,000 of which \$42,195,000 for 319,000 mules is the largest item. Cattle totalling 1,080,000 have an estimated value of \$25,483,000 including \$14,805,000 for 423,000 cows and heifers kept for milk. Other items making up the livestock

totals include 1,267,000 swine valued at \$6,810,000, 56,000 horses worth \$5,016,000 and 40,000 sheep valued at \$155,000.

Factory production of dairy products in 1938 included 3,108,000 pounds of butter, 2,094,000 pounds of cheese and 8,559,000 pounds of condensed, evaporated and powdered milk. The cash farm income derived from dairy produce in 1939 was \$14,251,000 made up of \$2,907,000 from chickens, \$3,655,000 from eggs and \$7,689,000 from milk.

Nearly eleven million pounds of fish, oysters, shrimp and crabs valued at approximately half a million dollars were taken from Alabama coastal waters in 1938.

The total catch for the year was fish, 5,402,200 pounds, valued at \$224,236 and shellfish (oysters, shrimp, crabs, etc.), 5,515,100 pounds valued at \$225,371.

## Timber

OUT of a total land area of 32,819,000 acres, forest land in Alabama consists of approximately 19,000,000 acres and of this, all but about 50,000 acres are classified as commercial forest land.

The sawtimber amounts to more than 38,000,000,000 board feet extending over an area of 10,175,000 acres with 2,500,000 acres of old growth made up of 6,100,000,000 board feet of softwoods and 5,700,000,000 board feet of hardwoods while second growth trees occupy 7,675,000 acres and support 19,200,000,000 board feet of softwoods and 7,000,000,000 board feet of hardwoods. The total softwoods amount to 25,300,000,000 board feet and hardwoods aggregate 12,700,000,000 board feet.

The cordwood area of 3,825,000 acres, which includes principally under-sawlog size trees, upperstems of sawlog size trees and limbs of hardwoods of sound trees only, contains a total volume of 16,675,000 cords—6,990,000 cords of softwoods and 9,685,000 cords of hardwoods. To this should be added 59,120,000 cords of hardwoods, located on the saw timber area. Combined, the total supply of cordwood for Alabama would probably exceed 80,000,000 cords.

Much of the softwood is pine and suitable for pulpwood, some of it being used already for that purpose in the manufacture of kraft and other papers at Tuscaloosa and Mobile. The southwest corner of the state embracing 12 counties and comprising two units of the Southern Forest Survey, has been estimated to contain in excess of 40,000,000 cords of pulp species on a productive forest land area of 5,729,700 acres.

In 1938, 1,082 mills in the state reported cutting 1,212,054,000 board feet of lumber including 1,043,699,000 board feet of softwoods and 168,355,000 board feet of hardwoods.

Production of naval stores is an important Alabama forest industry, and in 1939-40 gum turpentine in the amount of 28,697 fifty-gallon barrels, or 7.5 percent of the United States' entire production, was produced.

## Minerals

THE mineral resources of Alabama undoubtedly have been, apart from textiles, the greatest contributing factor in the industrial development of the State. Coal, iron, and a few other minerals are mined on a major scale; but there are several additional deposits of a varied assortment, not a few of which may justify further investigation for commercial production. The more important minerals, from a standpoint of current production, are marked on the accompanying map. Their total value was placed at more than \$53,500,000 for 1937.

The total supply of iron ore is believed adequate for 150 years as compared with an estimated supply of only 35 years for the rest of the country, based on the present rate of consumption. Coal deposits are estimated to underlie an area of approximately 8,000 square miles. In no other state is coal, iron, dolomite, and limestone, necessary for making pig iron and steel, found within a radius of five miles.

Dolomites, occurring principally in Jefferson County, offer possibilities in mining magnesia and form a basis for a large chemical industry.

There is also an extensive distribution of ochres that have not yet been developed to the extent they would appear to warrant; red and yellow being situated in no less than twelve different counties.

Clays form one of the major industries of the state with plants located in almost every county. Various types of clays and shales are widely distributed including kaolins, china clays, fire clays, pottery and brick clays.

In addition to the foregoing and the minerals shown on the map, there are other minerals whose extent is not yet known

or where industrial value may be in excess of the seemingly small quantity now available or produced.

These are listed as follows:

Arsenic	Lead
Barytes	Lead Sulphide
Copper	Manganese
Iron Pyrite	Manganiferous Ore
Gold	Zinc
Quartz	Quartzite

## Electric Power

THERE are ample electric power generating facilities in Alabama, the entire state being linked with a network of transmission lines interconnected with each other and also those of adjoining states.

As of January 1, 1940 there were 15 companies operating 44 plants with a total capacity of 981,884 kilowatts. Making up this total were 13 hydroelectric plants with a capacity of 719,130 kilowatts, 19 steam power plants capable of developing 258,080 kilowatts, and 12 internal combustion engine plants with a capacity of 4,674 kilowatts.

Actual production of electricity by public and private plants in 1939 totaled 3,943,236,000 kilowatt hours including 3,198,256,000 kilowatt hours from water power plants and 741,941,000 kilowatt hours from fuel operated plants.

## Taxation

PROVISION is made in Alabama law whereby the state, county and municipality may exempt new industry from ad valorem taxes except taxes on the land on which the plant is located plus the school district tax. These exemptions may be granted at the discretion of the state, county and municipality for a period not to exceed ten years. Alabama is the third state in the Union on a basis of low per capita revenue from taxation.

Property is assessed by law at 60% of fair cash value and this is liberally construed. The city rates vary from low figures to as much as \$1.50 per \$100.00 of assessment.

Outside of municipalities, taxes are as follows:

State .....	\$ .65
County .....	1.15
School District .....	.30
Total .....	\$2.10

Raw materials, including slag, not exceeding one normal year's requirements, are exempt from taxation. Finished products are exempt for 12 months after production. A capital stock tax does not apply to foreign corporations but does apply to capital actually employed in Alabama. It starts at \$5.00 for capital of \$1,000 on sums of \$50,000 and over of employed capital. The corporation franchise tax is \$2.00 per \$1,000 of capital stock. In Alabama there is a state income tax of 3% on total net income of domestic corporations and on foreign capital but applies to foreign corporations only on net income from business done in Alabama.

Total Federal internal revenue receipts in Alabama for the calendar year 1939 were \$15,464,565 while the assessed value of taxable property for the state in 1939 amounted to \$954,778,884.

## Labor and Wages

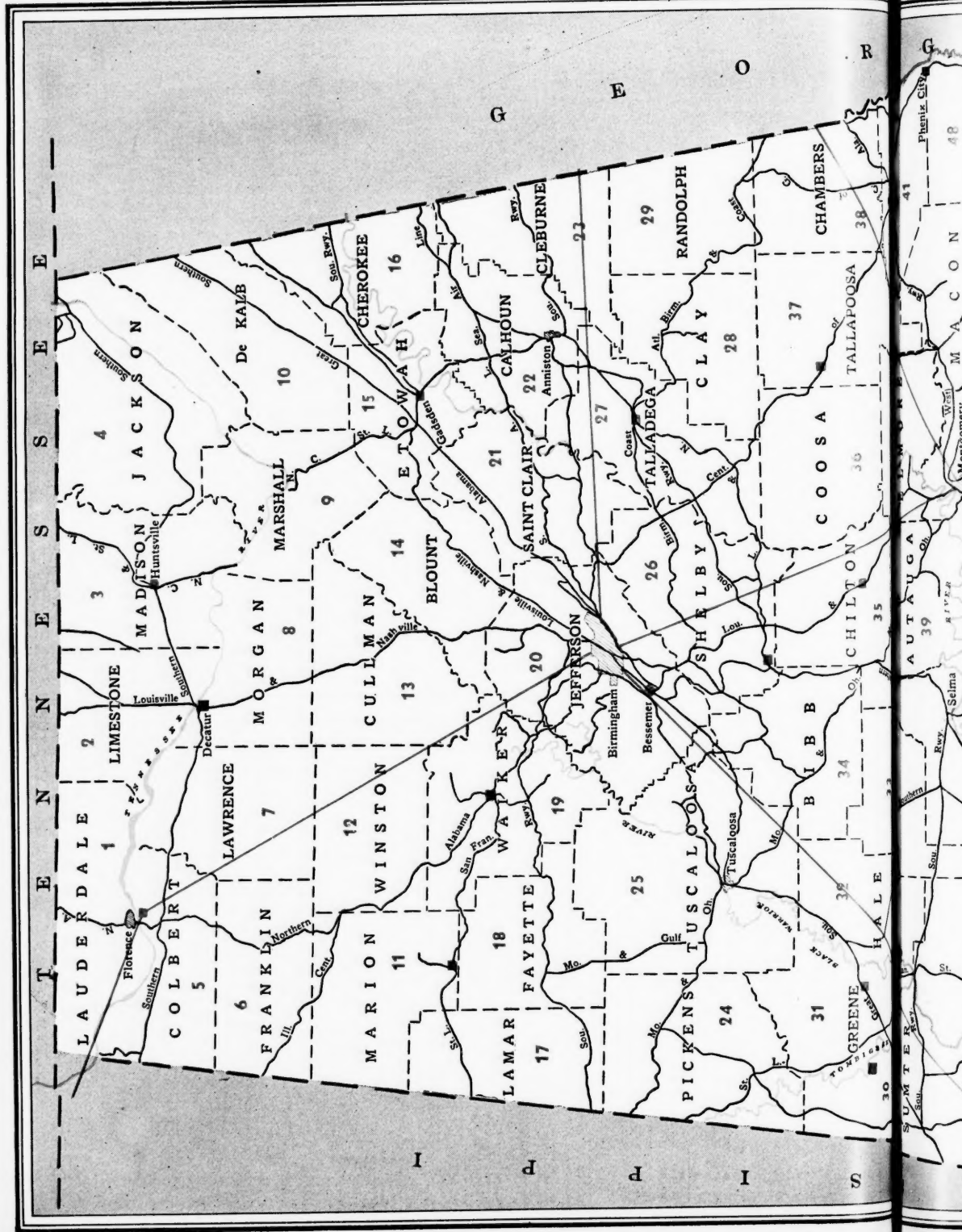
THERE is an abundant supply of labor in the State and experience has demonstrated that it is highly intelligent, quick to learn and extremely loyal, while skilled labor in a variety of lines is available in the more industrialized centers. Ninety-eight percent of the people of Alabama are of American parentage; 99.99 percent are citizens by birth; and 87.5 percent were actually born within the boundaries of the State.

In keeping with the tendency of decentralization, many of the plants which have recently moved into the State have located in small towns, which makes it possible for the labor to live on farms and in surrounding territory. This eliminates the mill village and affords an opportunity of industrial employment to supplement farm income.

The wage scale in the State varies according to the industry and type of labor, the range being from 30 to 40 cents an hour for common labor to \$1.25 and higher for skilled labor. The wage rate is that which prevails throughout the Southern section for a given type of labor.

# ALABAMA

Its principal raw materials and transportation facilities, with facts on the reverse side pertaining to its industrial growth and opportunities for industry.



Counties in which mineral is commercially produced.

## MINERAL

Asphalt rock—5  
Bauxite—5, 58, 61  
Bentonite—52  
Clay—10, 12, 14, 20, 21, 22, 25, 27, 29, 34  
Coal—11, 12, 14, 15, 18, 19, 20, 21, 25, 26, 34  
Coke—15, 20, 25  
Fullers earth—52  
Gold—27  
Graphite—28, 35, 36  
Gray ore—27  
Hematite—15, 20  
Iron ore—6, 14, 15, 16, 20, 22, 25, 27, 35, 56, 57  
Lime—5, 14, 20, 26  
Limestone and dolomite—4, 6, 7, 14, 15, 20, 26  
Limonite—6, 14, 16, 22, 25, 27, 55, 56, 57  
Manganese—14  
Manganiferous ore—22  
Marble—27  
Mica—28, 29, 35, 36, 37  
Sand, stone and gravel—3, 5, 6, 15, 19, 20, 21, 25, 40, 42, 43, 45, 62, 64  
Sandstone including ganister—16, 20, 22  
Tripoli—22

## TIMBER

Longleaf—19, 20, 21, 22, 23, 25, 26, 27, 28, 29, 33, 34, 35, 36, 37, 39, 40, 41, 47, 48  
Longleaf-slash—51, 52, 53, 54, 55, 56, 57, 61, 62, 63, 64, 65, 66, 67  
Mixed upland hardwoods—1, 2, 3, 4, 5, 9  
Mixed bottomland hardwoods—10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100

Shortleaf-hardwoods—1, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16  
Shortleaf-loblolly hardwoods—1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100



MIXED HARDWOODS—1, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16  
Shortleaf-loblolly hardwoods—4 to 61, 62, 63, 64, 65, 67  
Loblolly hardwoods—2, 3, 9, 66, 67  
NAVAL STORES—51, 62, 63, 64, 65

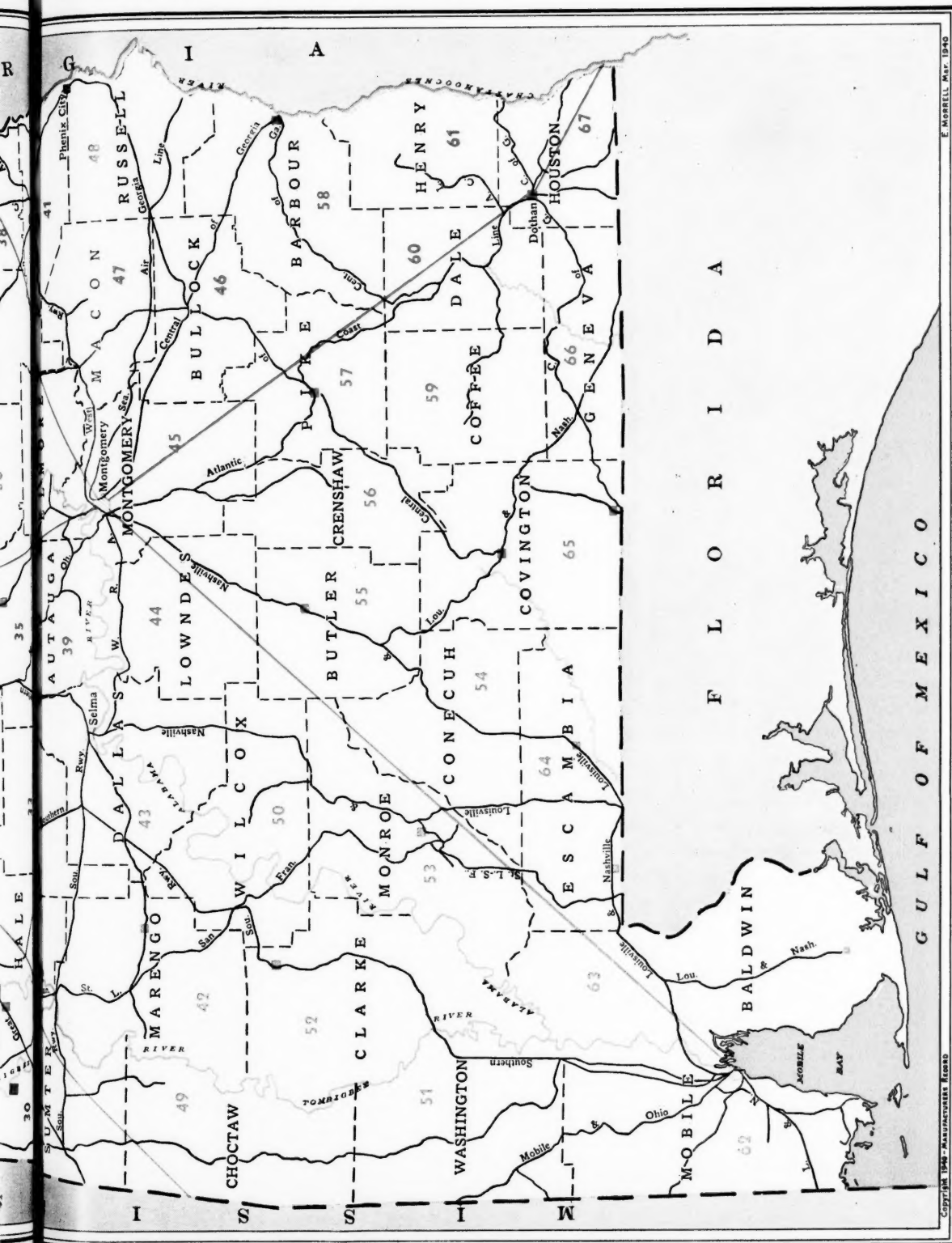
**AGRICULTURAL PRODUCTS**  
(Commercial Production)  
Corn—all counties  
Cotton—all counties  
Oranges—62, 63  
Peanuts—1 to 61, 63 to 67  
Pecans—1 to 4, 7 to 67  
Soy beans—2 to 4, 14, 20, 23, 38, 43, 47, 57, 60, 63  
Sugar cane—17 to 21, 24 to 67  
Sweet potatoes—9, 10, 13, 14, 15, 21, 60, 61, 66, 67  
Truck crops—all counties  
Tung oil—62, 63

**COMMERCIAL FISHERIES**  
—62, 63

Natural gas is available for consumption in the following counties: 15, 19, 20, 22, 23, 24, 25, 26, 27, 33, 40, 41, 43, 45, 47, 48, 62, 63

— Railroads  
— Navigable Rivers  
— Airlines

■ Airports also at principal cities printed in red.



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# ARKANSAS



*The Lion Oil Company's refinery at El Dorado is but one of the establishments in Arkansas utilizing the state's large mineral deposits and here will be constructed soon a new large polymerization unit to expand the present facilities and increase the existing output of petroleum products.*

## ARKANSAS' INDUSTRIAL FUTURE

“ARKANSAS is the state of this generation and the next. The rest of the country has been pretty well devastated by the generations that are past, but here is the future. We are looking at tomorrow in the rough. With the rest of us, pioneering is a memory. Here pioneering for you lives under the aegis of the new sciences which will make the new world.”

These are the words which William Allen White uses to describe the Wonder State of Arkansas. This state was admitted into the Union in 1836, the people having taken mat-

ters into their own hands and submitted a state constitution to Congress for approval before the latter got around to passing an enabling act. It was the twenty-fifth state of the Union.

The development of Arkansas has been steady, rather than spectacular. Although the first manufacturing industry in the state, the Hemphills Salt Works, was started in 1811, most of the advancement has taken place in the last fifty years. It is of interest to the in-

dustrialist seeking a location that in Arkansas the discovery and production of raw materials and the transportation facilities have far exceeded the manufacturing to date, and that there is a great latent electric power supply awaiting development. In other words, Arkansas has all the requirements necessary for industrial location, and is ripe for development.

For example, Arkansas is the third largest cotton-producing state in the country, yet it has only four cotton mills, employing 918 persons and having a production valued at



\$2,435,546 in 1937. Nine-tenths of the nation's bauxite is mined in two Arkansas counties, Pulaski and Saline, with production amounting to 306,568 long tons in 1938, which is somewhat below the average production of about 332,000 long tons for the past five years. However, practically all of it is shipped out of the state for refinement and manufacture into aluminum products, chemicals, and cement. Then too, although cotton seed products are, from point of view of value, the second largest item in the state's list of manufactures, there being twenty-five establishments employing 1,318 persons and having a production which was worth \$21,320,560 in 1937, by no means all of the state's available supply of cotton seed is yet utilized to the greatest manufacturing advantage.

However, progress is being made towards developing new industries in Arkansas. Investigations are being conducted to determine which particular types of manufacturing plants would seem to be most desirable to the state in the prosecution of a program to determine the basic principles underlying a sound industrial development. Some of the more important of these follow, together with accounts of the necessary raw materials which are available. These desirable industries are divided into two main classifications, those whose market would be nation-wide, and those which would produce for local consumption. Needless to say, they overlap in several instances.

Of the various manufactures whose market would be national, rather than local, one of the most important is cotton goods. Statistics concerning the four Arkansas cotton mills were given above, but with relation to the increase of this industry it should be noted

that less than half of the cotton lint grown in Arkansas is manufactured in Arkansas mills.

Another important item for consideration is the possibility of profitable paper mills in Arkansas. At the present time there are but two mills in the state, one located at Camden and the other at Crossett, but no figures are available concerning their production and consumption of raw materials since the Census Bureau does not release figures for states having less than three establishments for a given industry. The cordwood supply of timber for the state is estimated at 91,050,000 cords, of which approximately one-fourth is softwood. However, recent developments in paper manufacturing have enabled pulp plants to utilize hardwoods as basic raw materials, either by themselves in the case of some hardwoods or in conjunction with softwoods, depending on the paper to be made, and it can be seen readily how this increases the supply of wood available to pulp and paper manufacturers. At the present time considerable effort is being devoted to the possible establishment of a newsprint mill.

There has been little research into the possibilities of the clay deposits in Arkansas, but they are known to be widely distributed and of several varieties. Right now Arkansas clay manufactures are shipped all over the world, giving tangible evidence of the favor these products occupy in the international market.

*The Crossett Paper Mill at Crossett is one of Arkansas' pulp and paper mills using the large supplies of available timber. At the present time efforts are being made for the location of a newsprint mill.*

There is even a tourist shop in Havana whose entire stock of pottery is said to come from Arkansas. Of the many thousands of miles of clay fields in the state there has been little systematic study, and if such were undertaken it is probable, according to state geologist George C. Branner, that the supply discovered would be sufficient to serve as a foundation for several new clay-using industries.

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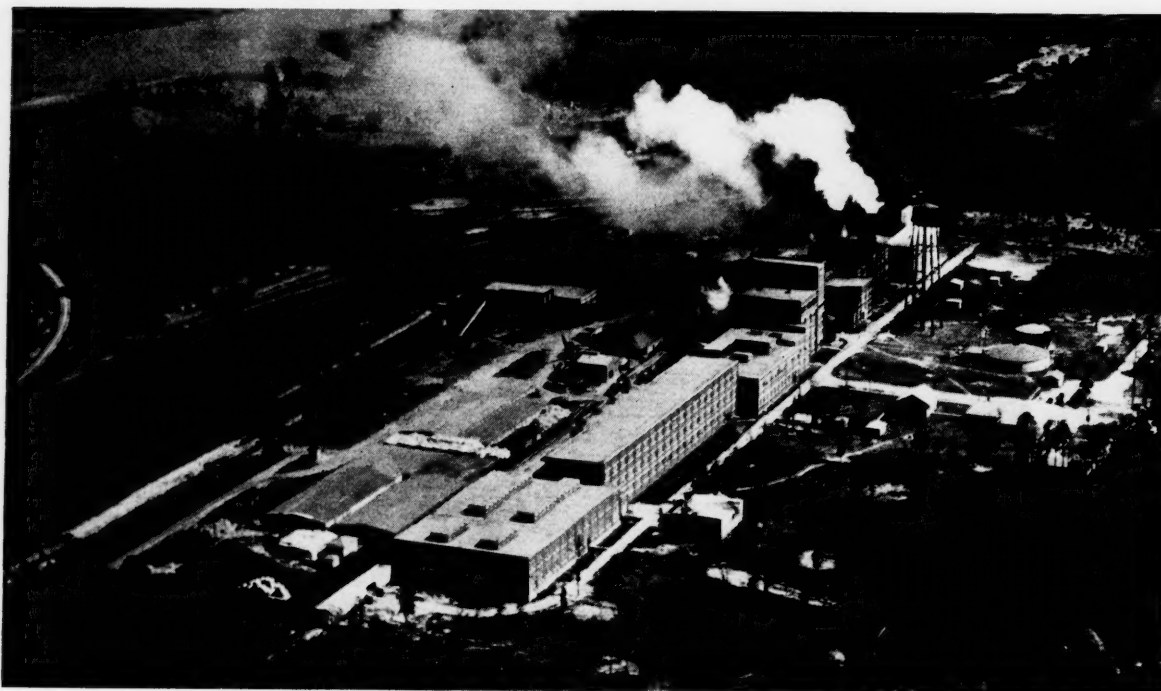
Arkansas mineral waters, which are present in unlimited amounts in the Ouachita and Ozark regions, according to Dr. Branner, are known all over the world. At the present time there is very little of this water bottled, but its profitable marketing should only be a matter of publicity and advertising.

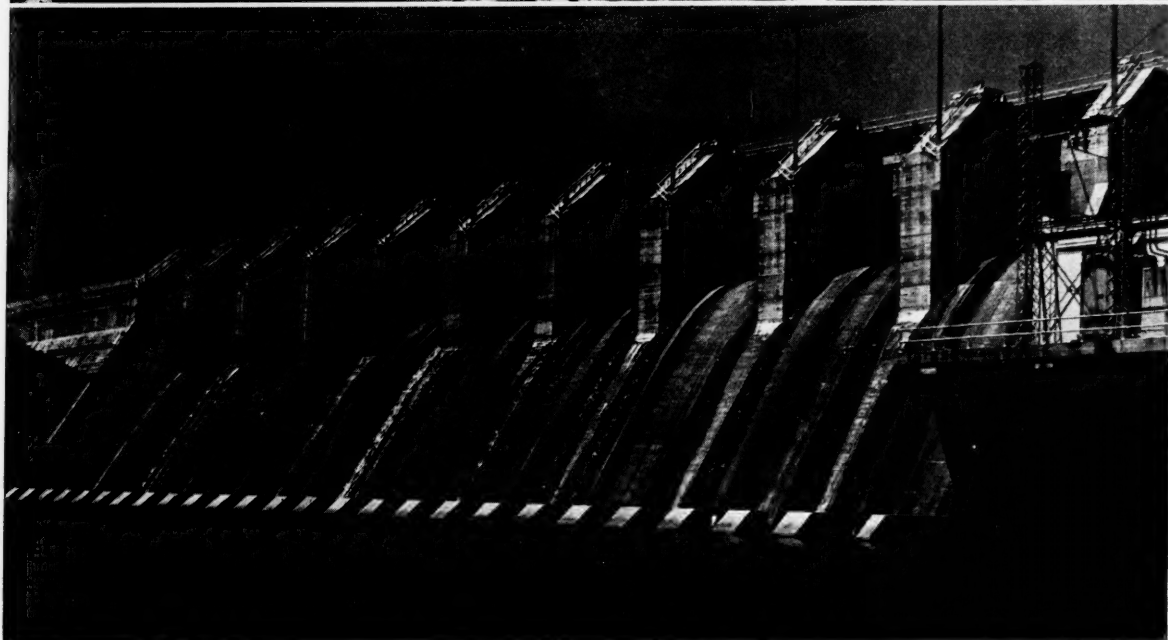
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There are a great many drug-bearing plants which either grow now or may be cultivated in Arkansas. Arum, trillium, rumex, delphinium, sassafras, hydrangea, ginseng, coriandrium, spigelia and verberna form but a partial list of the drugs which come from plants now growing in the state. Not only would the cultivation of these plants be profitable adjuncts for the farmers, but the extraction of the drugs and the manufacture of these drugs into forms adapted to commercial use opens up new industrial possibilities.

• • • • •

Bauxite in the past has been known chiefly as the ore from which aluminum was refined. Of the country's bauxite, as mentioned above, over nine-tenths is mined in Arkansas. However, although its importance as aluminum ore should be kept in mind, sixty-five per cent of the domestic bauxite production is now used





*Possessed of abundant natural resources, Arkansas offers great industrial opportunities. One of the largest concerns in the state already utilizing this wealth is the Southern Kraft Corporation (top) at Camden where local supplies of timber are converted into pulp and paper. Center—More than 1,000 men are employed here in the Missouri Pacific Lines' car and locomotive shops at North Little Rock—the city's largest industry. Bottom—Arkansas Power and Light Company's Carpenter Dam near Hot Springs is not only one of the state's outstanding hydroelectric developments but also is symbolical of the water power potentialities of the state.*



for the manufacture of chemicals and abrasives, particularly in the refractory line and in certain cements. This non-metallic use for bauxite has done much to stabilize the Arkansas output, as in the past, production has been influenced largely by the amount of imports which, though no better or as good when it comes to Al cement, contain less silica than the domestic ores and therefore are less costly to refine. Also, the matter of aluminum is important. Despite the large amount of bauxite produced in Arkansas, refinement of the ore and manufacture of aluminum is lacking, although virtually all of the raw materials necessary are in close proximity to the supply.

\* \* \* \*

Today perhaps the most rapidly advancing field of industrial activity is chemurgy. As an illustration of this, the U. S. Department of Agriculture is authority for the statement that from eighty-six agricultural products come 133 different raw materials used by industry, which are converted into 240 products which, in turn, have over 400 uses. Many erstwhile waste by-products of agriculture have been turned into vastly profitably commodities by chemurgy.

Let us consider but one phase, cellulose. Approximately forty per cent of southern straw, stalks, hulls, and other agricultural wastes consists of cellulose. A partial list of the products which have been made possible through various chemical treatments of cellulose would include paper, building board, insulating material, absorbents, rayon, lacquers, celluloid and other plastics, explosives,

*All the bauxite, from which aluminum is made, which is produced in the United States comes from the South and of this about 90 percent is mined in Arkansas. Above is shown the loading of bauxite at an open pit mine at Bauxite near the mill of the Republic Mining and Manufacturing Company, subsidiary of the Aluminum Company of America. The new aluminum plant soon to be built in the Tennessee Valley area for the Reynolds Metals Company will derive approximately 60 percent of its bauxite supply from Arkansas and adjoining states deposits.*

transparent wrappings, and cellulose sponges. There is scarcely any part of everyday life which is not influenced in one form or another by chemurgy.

\* \* \* \*

One other branch of industry which offers limitless possibilities is the manufacture of chemical products. Minerals form a large proportion of the prerequisites for this industry, and in this connection it might be mentioned that Arkansas has a plentiful supply of coal, petroleum, and natural gas. These, together with air and water, form the basic ingredients of many recent important developments in industrial chemistry, as are exemplified by such products as nylon and vinyon.

The major use of petroleum has been in the manufacture of motor fuel, lubricants, fuel oil and asphalts, but the foundation for new

chemical industries is being formed by research into the production of synthetic compounds from petroleum. The modern cracking process, which is used primarily to produce high octane motor fuels and gas, also yields large quantities of olefinic hydrocarbons. From these such synthetic products as alcohols, glycols, ethers, ketones, acids, chlorinated products, resins, insecticides, plant growth inducers, solvents, rubber substitutes and plastics are being produced. There would seem to be no good reason why such manufactures could not be made in Arkansas.

Another mineral whose uses have multiplied rapidly through chemical developments and research is coal. As has been mentioned, it is one of the basic materials used in the production of the synthetic fibers, nylon and vinyon. Chemicals derived from coal also have such varied uses as a reducing agent in the production of rayon and acting as important factors in the manufacture of better mildew inhibitors, wetting agents, and water-repellent finishes, to say nothing of the many now commonly accepted coal dyes.

It has only been recently that chemical developments have perfected and commercialized use of these coal dyes, and have relieved this country of dependence on foreign sources for its dyestuffs and other coal tar products. Today there are many products utilizing chemistry in their manufacture which were imported twenty-five years ago, but which are now supplied, either synthetically or actually, by domestic industries. A few of the more important of these are nitrates, camphor, potash, and neoprene, the chemically produced



rubber which can be manufactured in this country at less cost than that of imported rubber during the last war. There are many chemical products which are today imported, such as barbituric acids, ammonium silicofluoride, haarlem oil, naphthalene, various dyes, artificial musk, heliotropin, cobalt oxide and cobalt sulphate, dyeing and tanning extracts, isinglass, and magnesium oxide. It is reasonable to hope that all of these and many more may be either produced or substituted for by domestic industries utilizing chemistry.

Also important are those industries whose market would be chiefly local. One of the most important of these is the manufacture of low cost wearing apparel. In 1937 there were but three establishments in Arkansas engaged in manufacturing clothing, employing 488 persons and having a production for that year valued at \$1,455,852. This means that, provided all of the output of these establishments was sold within the borders of the state, Arkansans are spending an average of less than seventy-five cents apiece for clothing manufactured within the state. With the abundant cotton supply which is close at hand, there is no reason why Arkansas should not furnish by far the greater part of her low cost wearing apparel instead of importing the large amount which now must be necessary.

Using the same method of approach, figures reveal that there are thirty-four plants producing furniture and other wooden goods, employing 3,065 persons and having a production for 1937 valued at approximately ten million dollars. Taking the most extreme viewpoint possible and assuming that all of these products were bought in the state, there is still only a five dollar per capita expenditure for furniture and other wooden articles made in Arkansas. The plentiful timber supply has already been described, and mention has been made of the fact that of this supply, approximately three-quarters is comprised of hardwoods. Here is a splendid opportunity for industries, with the market close at hand.

A third opportunity lies in the direction of canneries. Canned and bottled fruit and vegetable products had an aggregate value of \$3,859,656 in 1937. Arkansas soil is well adapted to growing food for canning, and the truck crops and fruits now exported from the state might well be made to yield a higher income through processing, besides the economic effect on the state of the value added by manufacture and the number of people thus employed. Last year Arkansas had a cash income from all vegetables of \$3,357,000, and a cash income from fruits and nuts of \$5,301,000. The amounts produced for shipment of

some of the more important crops follow: sweet potatoes, 2,620,000 bushels; white potatoes, 3,003,000 bushels; snap beans, 132,000 bushels; cantaloupes, 144,000 crates; spinach, 133,000 bushels; and pecans, 3,543,000 pounds. Apples, peaches, grapes, and strawberries are also plentiful.

It should be borne in mind, however, that basic though they might be in consideration of new industrial locations, raw materials form only a part of the picture. Information concerning the composition and characteristics of labor and population in general; the proximity, area, volume, and character of markets for the finished products; climatic conditions and topography of the proposed location: all these and many more are of great importance to the industrialist.

Arkansas is richly endowed with raw materials along three general lines, agricultural, mineral, and forest products. A full treatment is found in the article which accompanies the Arkansas state map. It should be noted that there are many minerals which may well be available in such quantities as to make commercial production practical, although it might not have been attempted as yet.

The labor and population situation is particularly advantageous in Arkansas on two

(Continued on page 98)

## Arkansas and the

## Ark La Tex Area

is the bright spot on the map of farsighted industrialists who are expanding, relocating or seeking new environment. Opportunities here are illimitable . . . natural resources almost inexhaustible . . . climate ideal year 'round . . . labor native and friendly . . . transportation facilities adequate and modern. Abundant supplies of natural gas fuel at fair rates for every commercial, industrial and domestic need.

Map shows location of various major gas fields in area, and main gas pipe lines of Arkansas Louisiana Gas Co. system.

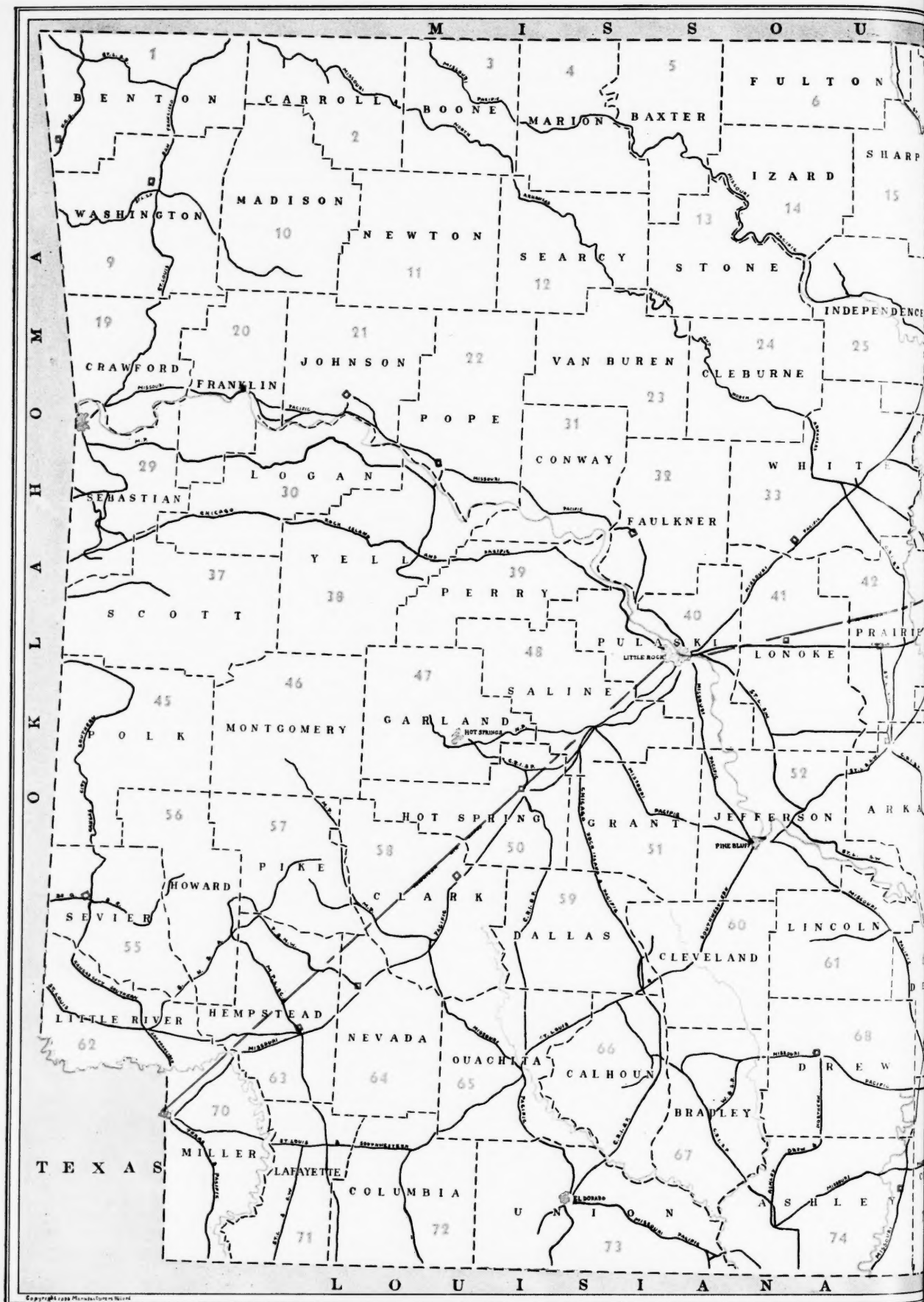
Our industrial engineers will be glad to consult with you. Write for complete information.

# ARKANSAS LOUISIANA GAS CO.

Little Rock, Arkansas

Shreveport, Louisiana

Serving more than one hundred communities in Arkansas,  
North Louisiana and East Texas



# ARKANSAS

Its principal raw materials and transportation facilities, with facts on the reverse side pertaining to its industrial growth and opportunities for industry.

## Mineral Counties in which mineral is commercially produced

Antimony—53 and 56  
Asphalt—57  
Barite—50  
Bauxite—10 and 18  
Bentonite—18 and 50  
Chalk—55, 56 and 62  
Clay—17, 18, 29, 40, 48, 50, 52, 53, 58, 63, 70 and 73  
Coal—9, 20, 21, 22, 29, 30, 32 and 37  
Copper—12 and 40  
Diamonds—57  
Dolomite—1 and 15  
Fuller's earth—18  
Glass sand—3 and 41  
Gravel—1 to 10, 13 to 21, 25 to 27, 29, 30, 32 to 35, 37 to 39, 43 to 48, 50 to 52, 54 to 68, 70 to 72, 74 and 75

Gypsum—57  
Lead—11, 10, 46, 50 and 53  
Lignite—  
Limestone for building—1, 12, 14, 15, 25, 26, 40 and 55  
Limestone for burning—1, 2, 9, 8, 12, 14, 25, 40, 42 and 55

Lithographic stone—11  
Manganese—11, 14 and 25  
Marble—1, 12, 14 and 25  
Natural gas—9, 20, 21, 22, 29, 30, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75  
Nephelite syenite—10, 47, 48 and 50  
Novaculite—17 and 50  
Onyx marble—2  
Petroleum—1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75  
Phosphate rock—23  
Quartz crystals—46, 47 and 50  
Quicksilver—57  
Rutile—30  
Sand—1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75

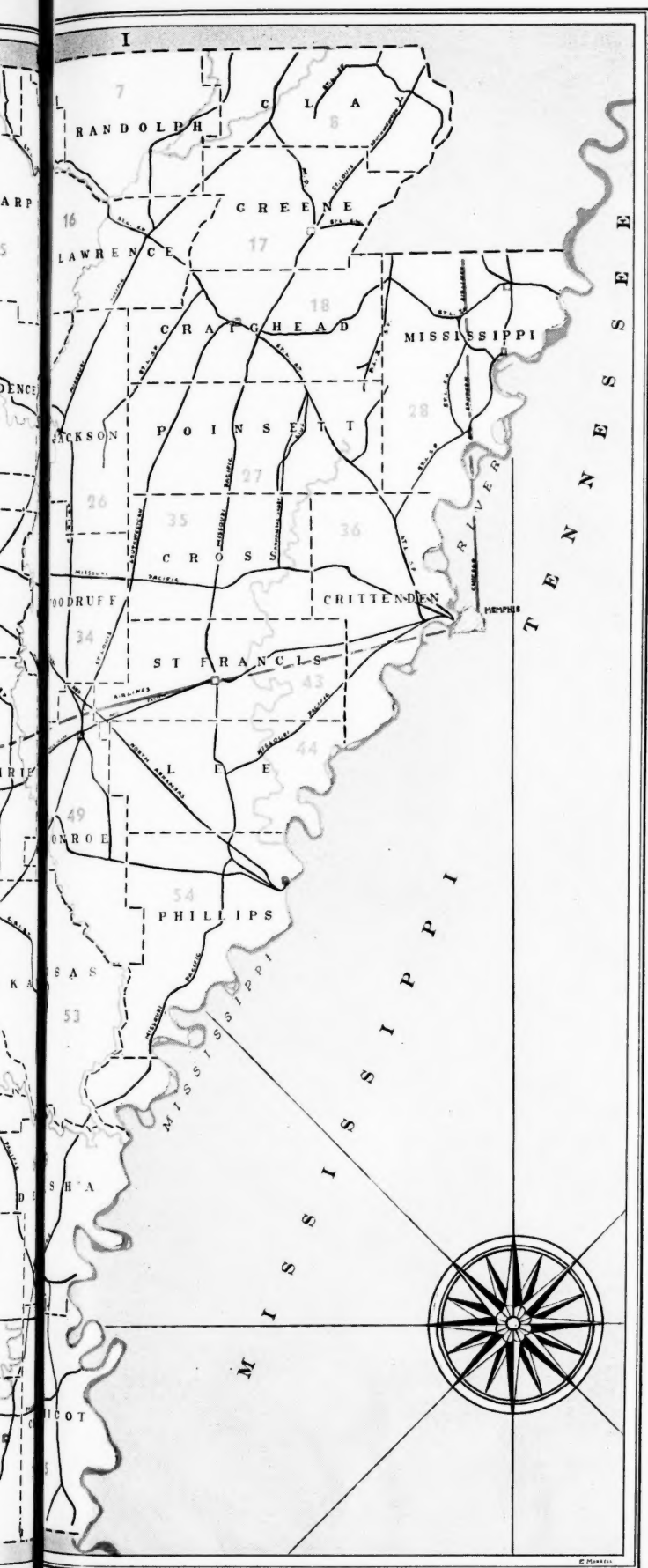
Sandstone—1 to 5, 9, 12, 14 to 16, 19, 21 to 24, 29, 31 to 33, 40, 41, 42, 50, 57, 58 and 62  
Slate—40, 45, 46 and 47  
Tripoli—1 and 50  
Zinc—3, 4, 11, 12, 15, 16, 48 and 53

## Agricultural products

Corn—11 counties  
Cotton—3 to 9, 11 to 73  
Peanuts—8, 14, 15, 18 to 26, 29 to 34, 37, 38, 40 to 42, 45 to 74  
Pecans—7, 16, 25 to 28, 31, 33 to 36, 40 to 44, 48 to 50, 52 to 54, 58 to 65, 67 to 75  
Rice—8, 16 to 18, 26, 27, 31, 35, 41 to 44, 49, 52, 53  
Soybeans—11 counties  
Sugarcane—60, 61, 64 to 65  
Sweetpotatoes—11 counties  
Tobacco—1 to 9, 9 to 14, 15 to 25, 30, 37 to 41, 43 to 47, 53, 54, 62

Natural gas is available for consumption in the following counties:—1, 9, 16, 18 to 22, 25, 26, 29 to 33, 37, 38, 40, 41, 47, 48, 50 to 53, 56, 58, 59, 61 to 65, 67 to 75.

—— Railroads  
—— Navigable Rivers  
—— Airlines  
□ Airports—also at principal cities printed in red





# Arkansas—

## Its Development and Future Opportunity Based on Wealth of Resources

ARKANSAS, sometimes referred to as the "Wonder State," was described by the first white man to see it, Hernando De Soto, as a "fair and pleasant land." Included in the area covered by the Louisiana Province, the territory was for 37 years under the sovereignty of Spain, but in 1800 it again reverted by treaty to France and in 1803 finally became a territory of the United States, within the District of Louisiana—St. Louis being the capital. In 1806, the District of Arkansas came into existence, but was not officially recognized as such until 1808. It was established as the Territory of Arkansas in 1819. It was, therefore, as a Territory that Arkansas continued until its admission in 1836 as the twenty-fifth state in the Union.

With an area of 53,335 square miles, Arkansas ranks twenty-sixth in size and twenty-third in population which in 1939 was estimated at 2,048,000. The colored race comprise approximately one-quarter of this number.

### Climate

THE climate of Arkansas closely conforms to that of the other Southern states being largely temperate with extremes of temperature rarely occurring except in the northern part of the Arkansas valley and certain sections of the Ozark plateau. The average annual precipitation of forty-eight inches is distributed evenly throughout the year's average of 105 rainy days varying only from 4.2 inches in January to 3.8 inches in July. The temperature, which averages 61.4° Fah. throughout the year, ranges from 41.3° Fah. in January to 80.5° Fah. in July.

### Transportation

ONE of the essential factors in industrial development is adequate transportation facilities. In this respect Arkansas is well equipped with nearly 5,000 miles of railroad, approximately 10,000 miles of improved State highways, and barge service on several navigable waterways traversing the State.

The railroads, ninety percent of which are operated by six lines with through-connections to all parts of the country, provide ample service from almost every part of the state to near and far markets besides rapid transportation to Gulf ports for foreign and coast-wise shipments.

Of the state highway system, more than twenty-five percent is surfaced and nearly seventy-five percent are gravelled all-season highways suitable for present day passenger and freight demands. In addition, the waterways provide means of freight transportation throughout the length of the Mississippi on the eastern border of the State and also on the White river to DeValls Bluff and the Ouachita river up to Camden. Projects are under way to revive navigation on the Arkansas river through the state to Fort Smith.

Commercial airlines operate across the state with connections to virtually all parts of the country and will be extended further by inauguration of the new airline soon to go into service. There are twenty-four airports and fields located throughout the state.

### Manufactures and Finance

THE value of Arkansas' manufactured products in 1937 was \$164,676,277 or \$45,335,409 more than the 1935 value of \$119,340,868. By far the most outstanding manufacture was the wood using industry whose value in 1937 was \$51,928,049 and employed approximately 30,543 people. Other important manufactures were oil, cake and meal from cottonseed valued at \$21,320,560 and petroleum refining, the products of which were valued at \$14,383,526. Although Arkansas ranks third in the production of cotton, only four textile mills are in the state. These had an aggregate production of \$2,435,546 in 1937. Altogether \$99,088,930 was expended for materials, containers, fuel and power, while over fourteen per cent of the gainfully employed population was engaged in manufactures. This does not include mining.

The 1937 State legislature provided for the establishment of an Agricultural and Industrial Commission to survey the state for its industrial possibilities and to make the findings available

for those seeking locations for new or expanding industries, also to administer certain tax exemptions provided for new and expanding industries. In addition, a proposed constitutional amendment was adopted in the November election, permitting the Legislature to enact a Workman's Compensation Law.

The banks of the state, numbering 216, whose capital stock totals \$13,652,000 had, in 1939, individual deposits amounting to \$176,548,000 and aggregate resources of \$202,743,000 while the savings deposits were \$44,026,000. Three clearing house exchanges reported bank transactions as \$461,573,000.

### Agriculture

ARKANSAS is predominantly agricultural, both from the point of view of employment as well as source of income. About sixty percent of the gainfully employed population are agriculturally engaged.

The cash farm income totaled \$159,583,000 in 1939, including \$91,628,000 from crops and \$40,048,000 from livestock and livestock products.

In 1939, a total of 6,093,000 farm crop acres were harvested of which 2,125,000 acres were devoted to cotton and produced 1,410,000 bales which yielded a cash income of \$60,231,000 while 627,000 tons of cottonseed brought an additional \$10,542,000. Other important crops with their respective production were: rice, 8,721,000 bushels; corn, 32,318,000 bushels; sweet potatoes, 2,680,000 bushels; and peanuts, 29,070,000 pounds. Other crops raised in Arkansas are as diversified as in most Southern states with horticultural crops contributing a large portion.

Livestock in 1939 totaled 3,040,000 head and were valued at \$70,640,000 with 1,174,000 cattle worth \$28,928,000—including 466,000 cows and heifers kept for milk and valued at \$16,520,000 comprising the largest group. The cash farm income from dairy products was \$17,656,000.

### Timber

NEARLY two-thirds of Arkansas' 33,616,000-acre land area is forest land. Of this area, comprising 20,915,000 acres, approximately 20,670,000 acres is commercial forest land with a saw timber stand of 36,795,000,000 board feet. Making up this stand are 18,500,000,000 board feet of softwoods—4,485,000,000 board feet in old growth and 14,015,000,000 board feet in second growth, and 18,295,000,000 board feet of hardwoods—7,775,000,000 board feet in old growth and 10,520,000,000 board feet in second growth. The total old growth volume covers 2,695,000 acres and the main part of the second-growth saw-timber volume is found on 7,795,000 acres.

The area classified as cordwood covers 4,715,000 acres and contains 4,290,000 cords of softwood and 17,080,000 cords of hardwood, or a total of 21,370,000 cords. If to this is added the saw timber area in terms of 19,210,000 cords of softwood and 50,470,000 cords of hardwood (a total of 69,680,000 cords), the entire cordwood supply for the state is 91,050,000 cords.

While the foregoing figures are for the entire state, actually only the first four units have been surveyed by the United States Southern Forest Survey with acreages by forest type as follows. Unit five is characterized mainly by upland hardwood types.

#### ARKANSAS Units 1 & 2

Forest type	Area in acres
Red gum—water oak	673,200
Mixed oaks and hardwoods	1,044,300
Cypress—tupelo gum	267,200
Overcup oak—bitter pecan	460,400
Cottonwood—willow	282,100
Hackberry, elm, ash	643,700
Water oak	501,200
Upland hardwood	170,400
Scrub oak—scrub hardwood	185,100
Pine—hardwood	57,100
Total	4,284,700

#### MANUFACTURERS RECORD

## ARKANSAS Units 3 & 4

Forest type	Area in acres
Shortleaf pine .....	2,085,000
Shortleaf—loblolly pine .....	739,600
Loblolly pine .....	923,000
Shortleaf pine—hardwoods .....	1,420,900
Loblolly pine—hardwoods .....	1,154,400
Upland hardwoods .....	1,653,300
Scrub hardwoods .....	113,800
Bottomland hardwoods .....	1,344,500
Cypress—tupelo .....	40,300
Total .....	9,474,800

The northeastern part of the State originally possessed a dense virgin hardwood forest of excellent quality. This being in proximity to northern markets consuming hardwoods and being valuable agricultural land has resulted in some diminution of the forests, yet hardwoods in quantity are available for commercial use. In the remainder of the state, timber grows in abundance to supply a large lumber market as well as the demand from pulp and paper mills.

Much of the state's annual cut of over two billion board feet of timber is consumed in furniture, pulp, and paper, mill work, acetic acid, methanol and other chemicals.

## Mining and Minerals

**I**N addition to agriculture, forest product and manufacturing industries, Arkansas supports a mining industry that, in some respects, is almost certain to grow beyond its present status.

On the over page map are indicated those minerals which are now or have been commercially produced. Their annual value during the past ten years averaged approximately \$26,000,000. Although certain products, such as petroleum, coal, bauxite, natural gas, manganese and zinc are generally known to be produced in Arkansas, with bauxite comprising ninety-five percent of the country's production, other minerals now produced include cement and clay products materials, sand and gravel, natural gasoline, stone, glass sand, mineral waters, novaculite, gypsum, slate, barite, tripoli, rutile, mercury and lead. The minerals shown on the map are, in many instances, found in other counties than those shown even though there may be no commercial production of them.

It seems probable that, so far as annual value is concerned, Arkansas will continue to be principally a fuel producing state for many years to come, as the aggregate value of petroleum, natural gas, natural gasoline and coal has made up over 86 per cent of the value of the state's mineral production since 1920.

The reserves of certain of the minerals produced are, as of January 1, 1940, estimated to be as follows:

Minerals	Reserves Jan. 1, 1940	Estimated years reserves will last based on 1939 Pro- duction
Barite .....	997,545 sh. tons	406
Bauxite .....	25,000,000 lg. tons	62
Coal .....	1,512,073,871 sh. tons	1300
Lignite .....	44,019,000 sh. tons	..
Manganese .....	205,498 lg. tons	64
Manganiferous ore .....	105,313 lg. tons	28
Natural gas—		
W. Ark. ....	996,213,000 M cu. ft.	245
S. Ark. ....	266,413,460 M cu. ft.	18
Petroleum .....	320,148,000 barrels	15
Phosphate rock .....	20,000,000 lg. tons	..
Zinc .....	131,650 sh. tons	549

The discovery of quicksilver in the southern portion of the Ouachita mountains in 1931 has resulted in the establishment of a new mining industry. The district is some 25 miles in length and contains important reserves of quicksilver. Approximately 3,500 flasks of metal have been shipped since 1931.

Titanium oxide, which occurs commercially at but a few points in the United States, has been mined in the Ouachita, Mountains since 1934 and some 2,200 tons of concentrates have been shipped.

The quarrying of bedded barite is a new mining industry in the Ouachita Mountains and promises to be one of some importance.

The reserves of non-metallic minerals are, for the most part, practically unlimited, and include deposits of chalk and marl in the southwest, limestone, dolomite and glass sand in the north, and clay and shale deposits which are widely distributed. Marble deposits cover large areas in the Ozarks and include black marble which is unique in the United States.

The mineral waters, known internationally, can be obtained

in practically unlimited quantities in the Ouachita Mountains and Ozark Plateaus. In the same areas is an abundant supply of tripoli, while vari-colored slate deposits, used for making roofing gables, occur in the Ouachita Mountains. Building stone, crushed and broken stone, and sand and gravel are widely distributed. The whetstone rock deposits which occur in central and western Arkansas are also practically unlimited in extent.

The diamond mines in Pike County are located in the only known area where diamonds occur in the rocks in which they were originally formed on the North American continent. Approximately ten per cent of the output has been gems, the remainder industrial diamonds.

Supplementing the minerals mentioned, asphalt, fuller's earth, phosphate rock, antimony, iron and silver are known to be present in the state. It remains for further examination to demonstrate the quantity of these and other mineral deposits which are not now worked commercially.

## Electric Power

**T**HE existing electric power facilities of Arkansas are more than adequate for such demands as may be anticipated in the immediacy and with full provision for future expansion.

During 1939, production totaled 230,799,000 kilowatt hours of which 106,851,000 was produced from the five hydroelectric plants. Altogether, there are fifty-five plants operating in the State. These with their generating capacity are:

3 Arkansas Power & Light Company hydro-electric plants .....	65,968 kilowatts
4 Arkansas Power & Light Company steam plants .....	41,524 kilowatts
2 Arkansas Missouri Power Corporation hydroelectric plants .....	1,040 kilowatts
19 Miscellaneous steam plants .....	38,564 kilowatts
27 Internal combustion engine plants ....	13,507 kilowatts
	160,603 kilowatts

In addition, there are approximately 150,000 kilowatts of generating capacity available from interconnections of the Arkansas systems with those in other states.

## Taxation

**A**T the general election in 1937 Arkansas declared by constitutional amendment that all capital invested in new manufacturing or processing plants or in the expansion of old manufacturing or processing plants, may be exempt from the state millage tax for a period of from one to ten years. Arkansas has no use tax.

Tax rates in the various counties of Arkansas range from \$2.57 to \$4.35 per \$100 of assessed valuation. The basis of assessment is fifty per cent of true valuation and this is liberally construed.

There is a franchise tax on corporations of \$1.10 per \$1,000 of capital stock, the minimum tax being \$11.00. The income tax rate for industry is a flat two per cent with \$1,500 exemption allowed.

Severance taxes on raw materials are 2.6 per cent of gross cash market value at point of severance on all minerals except coal which is one cent per short ton, and manganese which is 10.1 cents per long ton. On minerals sold from state owned lands and waterways, the rates are: 2.5 cents per cubic yard on sand; five cents per cubic yard on gravel; six cents per short ton on coal; oil, gas and casinghead gas are subject to 1/8th the value produced and saved.

On all retail sales within the state, there is a two per cent tax. The assessed value of all taxable property in 1939 totaled \$436,197,282.

## Labor

**L**OW population density is a characteristic exemplified in Arkansas by the fact that almost eighty per cent of the population is classified as rural. This is a condition favorable to industry in its recent trend toward decentralization and location of plants outside metropolitan centers. Of the white population, 99.3 per cent are native born Americans. The negro percentages are approximately the same.

Little Rock, the state capital, has a population of 88,129 which, together with sixteen other cities whose populations range between 5,000 and 32,000, comprise sixty-eight per cent of the total urban population of the state.

The prevailing rates of pay for common labor are twenty cents to forty cents hourly, thirty cents to fifty cents hourly for unskilled labor and thirty-five cents to \$1.25 per hour for skilled labor.

Arkansas labor is abundant, generally intelligent and industrious; and during the past several years, there have been scarcely any labor disturbances throughout the various industries of the state.

## Arkansas

(Continued from page 93)

counts. Roughly one-quarter of the population is comprised of negroes, and less than one per cent is foreign born. Of all Arkansans over working age, forty-seven per cent are gainfully employed, with an average of 1.3 workers to every family. This is tangible proof that Arkansas laborers are industrious. The amount of labor disputes in the state in the past few years has been negligible.

There is one important aspect to the labor situation in which few states are as well off as is Arkansas. Industry has recently been leaning towards decentralization, yet such a trend is hampered by labor shortages in small towns and by the difficulties in persuading skilled labor to leave large cities. However, these difficulties are greatly reduced in Arkansas, as the present population is already decentralized to a large degree. According to the 1930 census, only 21.6 per cent of the inhabitants of the state can be classified as "Urban," with the population density at 35.3 per square mile, and even based on 1939 estimates the density is only 38.3 persons per square mile.

Arkansas' central location places her within easy reach of a vast market. Within five hundred miles of the state's borders lies a population of 55,000,000, or roughly forty-two per cent of the nation's total. The entire southwest area is accessible to Arkansas goods, and the state is strategically located to serve the Mississippi area and the port of New Orleans, as well as the great industrial areas to

the north, to which it is connected by the Mississippi and its tributaries.

The transportation facilities for getting these goods to the markets are excellent. The highways include five national motor routes and over ten thousand miles of state roads. There are nearly five thousand miles of rail in Arkansas, of which ninety per cent are owned by seven major companies, including six trunk line railroads. Navigable streams provide the eastern and southeastern sections of the state with direct transportation to New Orleans and the foreign markets, as well as the north central area. There are thirty-three airports, and the city of Little Rock has two transcontinental air services daily.

Power facilities always loom large in any industrial plans. Arkansas is richly endowed with the fuel minerals, coal, petroleum, and natural gas, while the streams of the state have an estimated hydro-electric power capacity of over 500,000 horse power, of which over

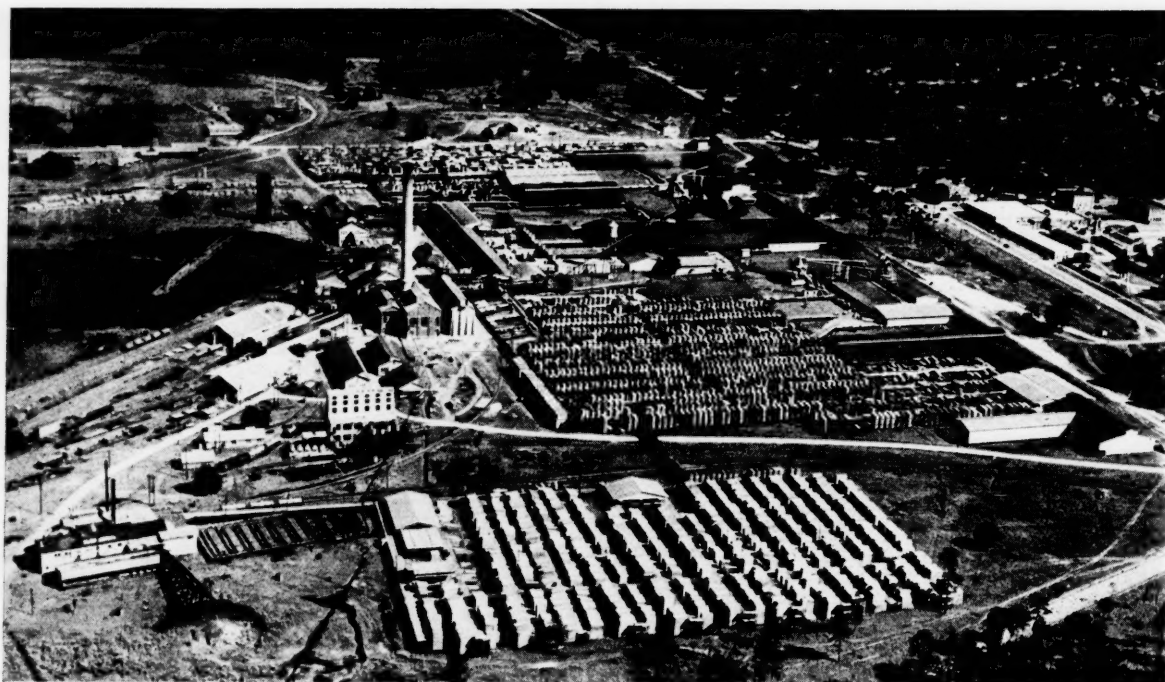
*The vast forests of Arkansas have long been the source of the state's principal industries with products valued at more than \$50,000,000 annually. One of the largest enterprises in the state using the forest resources is the Crossett Lumber Company located in the city of the same name. This timber mill with lumber yards is seen in the foreground of this picture, while in the background is the Crossett Chemical Company where many waste products of the timber mill are converted into other commodities.*

forty per cent is undeveloped or unharnessed.

Industrialization is aided by favorable climatic conditions. The mean annual precipitation ranges from forty inches to fifty-five inches, with the heaviest rainfall taking place in the southeastern section of the state. The rainfall is spread evenly throughout the year, with an average of 106 rainy days. The mean annual temperature ranges from fifty-five degrees in the north to sixty-five degrees in the extreme south. The growing season in most parts of the state is over 210 days long, with the exceptions being in the higher parts of the Ozark and Ouachita mountains.

Topographically, the state consists of two sections, divided roughly by a line running from the northeast to the southwest corners. The southeastern section is the Gulf Coastal Plains, and the northwestern highlands are comprised of three distinct divisions, the Ozark uplands, the Arkansas Valley, and the Ouachita Mountains. The plains contain over 27,000 square miles which rank with the most fertile land in the nation, and the highlands contribute most of the state's mineral wealth.

Thus it may be seen, as has often been said, that Arkansas represents the last frontier in the United States. Here is a land which is rich in raw materials, has an ample and industrious labor supply, contains great potential power facilities, is well equipped for transportation of goods, has an advantageous climate, and is, in short, thanks to its abundance of all the facilities necessary to the support of industry, the ideal spot in which to locate a thriving manufacturing business.







# ARKANSAS *is the Nation's* *New Industrial Opportunity Area*

Manufacturing plants are fast changing the economic heritage of Arkansas. Agriculture is bending the knee to industry in values created. Of the total wealth produced in Arkansas during 1935, manufacturing comprised 31% — a gain of 14% over 1900.

This constant increase represents a trend in Arkansas. It is a movement in which such industries as paper mills, oil refineries, furniture manufacturing plants, edible oil refineries, food and feed processing plants, forest product manufacturing, and mining have all discovered the necessary elements for operating at a profit.

Contributing to this industrial trend, the 9,000 miles of highway and the 4,500 miles of railway transportation systems have had major influence. Adequate, economical and satisfied labor coupled

with unlimited cheaper fuel supplies have combined favorably for capital.

Within a 500-mile radius of Arkansas boundaries a distributing market of fifty-six million persons offers itself for promotion to industrialists who are pursuing the policy of decentralization.

And finally, the citizens of Arkansas have become cognizant of the industrial advantages which lie ready for development by both home and foreign capital. In 1938 Arkansas provided for a Workman's Compensation law by Constitutional amendment. This, together with other pieces of favorable legislation, tend to insure security for invested capital.

Yes, the citizenry has become determined in its planning and developing to see that industry gets a break in Arkansas — the nation's No. 1 industrial opportunity!

## 100 ARKANSAS Leaders Suggest Opportunities

In response to an industrial poll made during the Spring of 1940 by the Agriculture and Industrial Commission, 100 leading citizens of Arkansas listed the industries most needed in their communities. Since this poll was statewide, it represents actual needs recognized by civic leadership. Their response included the following suggestions for development:

### FOOD PROCESSING

Canning Plants for Fruits,  
Vegetables, Soy Beans  
Cheese Plants  
Packing Plants for Meat and  
Poultry  
Quick Freeze Plants

### FINISHED LUMBER PRODUCTS

Furniture Factories  
Pegs and Spools  
Veneer Boxes and Baskets  
Small Wood Using Industries  
Ax and Hammer Handles

### AGRICULTURAL ENTERPRISES

Rice Mills  
Pecan Orchards  
Flax Production  
Stock Yards  
Poultry Hatchery  
Fish Hatchery  
Cotton Compress

### MINING AND QUARRYING

Pottery Plants  
Clay Building Materials  
Rock Wool  
Slate Roofing  
Marble and Granite  
Cement Plant  
Gypsum Plaster

### CHEMICAL PLANTS

Potato Starch Plant  
Plastics Plant  
Soap Plant  
Wood Distillative Plants

### WOOD PULPING PLANTS

Newsprint Mills  
Kraft Paper Mills  
Blotter Factory  
Wall and Insulating Board  
Rice Straw Paper

### REFINERIES

Cotton Seed Oil  
Petroleum  
Soybean Oil

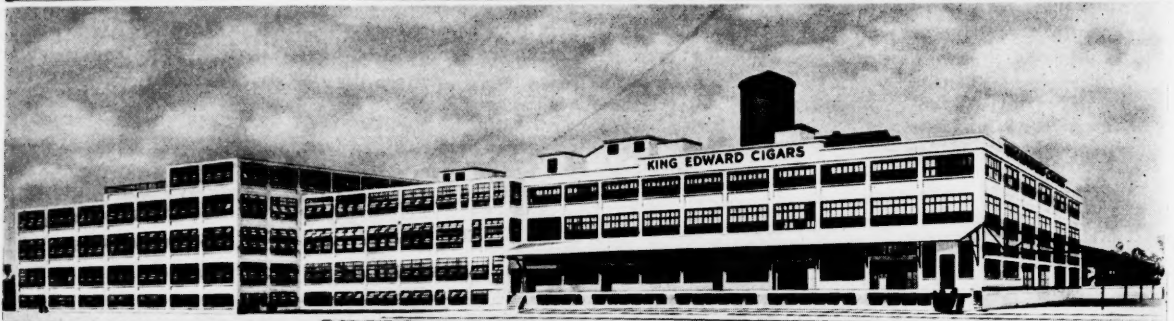
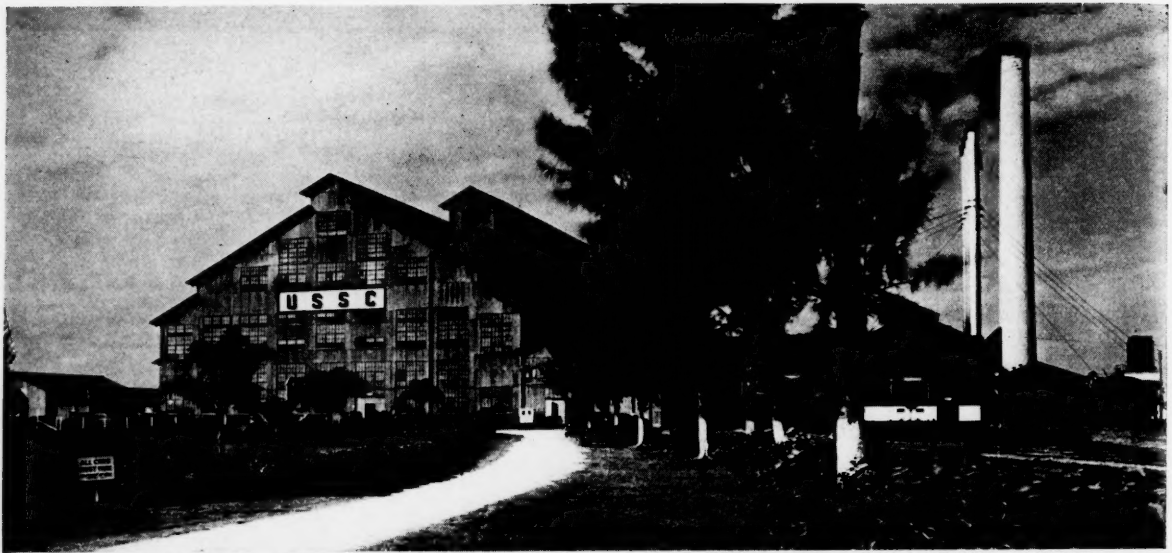
### COTTON TEXTILE PLANTS

Cotton Mills  
Textile and Garment Plants  
Cotton Bags and Sacks  
Mattress Factories  
Coverlets, Rugs, Drapes

For further information concerning the particular industry in which you are interested, direct correspondence to H. K. Thatcher, Agricultural and Industrial Commission, State Capitol, Little Rock, Arkansas. This Commission is coordinating its activities with those of the Utilities Commission, Arkansas Planning Board, Arkansas Geological Survey and the Arkansas Publicity Advisory Commission to achieve the maximum beneficial results toward helping industry operate profitably in Arkansas.

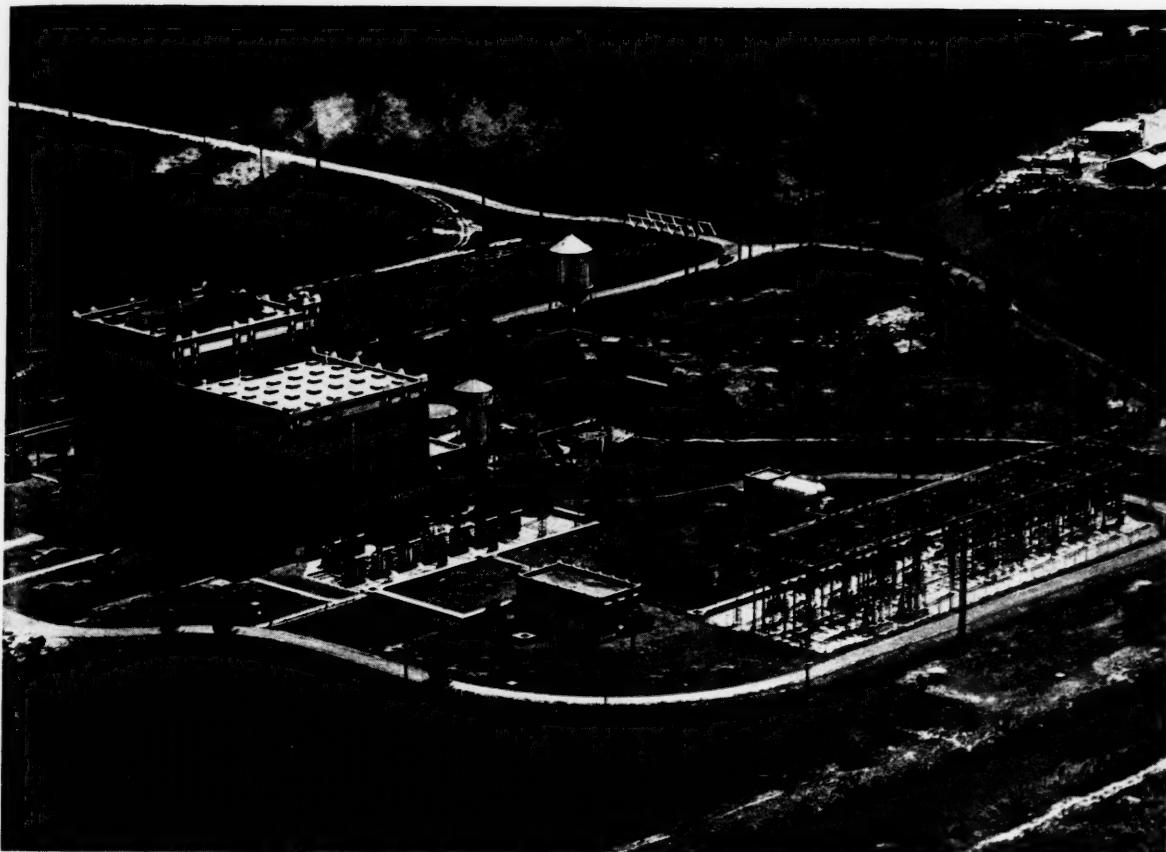
SOUTH'S RESOURCES ISSUE

# ARKANSAS



Top—Here in the Sugar House of the United States Sugar Corporation at Clewiston is crushed annually the hundreds of thousands of tons of sugar cane grown in the Florida Everglades; with a capacity of 6,000 tons of cane per day, this sugar house is well able to take care of the state's cane production. Florida shares with Louisiana the distinction of being the only producers of sugar cane for sugar. Center—Florida is a large cigar manufacturing state and this plant of John H. Swisher and Son, Inc., at Jacksonville is the largest cigar plant under one roof in the world. Bottom—The extensive construction in Florida has been an incentive to establish construction materials plants and the Florida Cement Company at Tampa is one of the state's largest producers.

# FLORIDA



*Lauderdale steam electric plant of Florida Power & Light Company, located near Dania, Fla. The generating capacity of this plant is being increased 50 percent by installation of 30,000 kilowatt steam turbine generating unit and new wing as tall as an eight story building. Cost of the expansion exceeds \$3,500,000.*

## THE ECONOMIC DEVELOPMENT OF FLORIDA

THE State of Florida offers, perhaps, a greater variety of opportunity today than any other state in the Nation. In its history, physical characteristics, and development, Florida is unique among American states. It was the first part of our country to receive a permanent settlement, and the latest to be developed. It is the only one of our states to extend into the semi-tropics, and hence is nearer a larger portion of the rapidly-expanding Latin-American markets and sources of supply than any other state. It has a soil capable of producing valuable fruit, vegetable and farm crops, and of sustaining a thriving livestock industry. It is covered with forest lands, from which are obtained the raw ma-

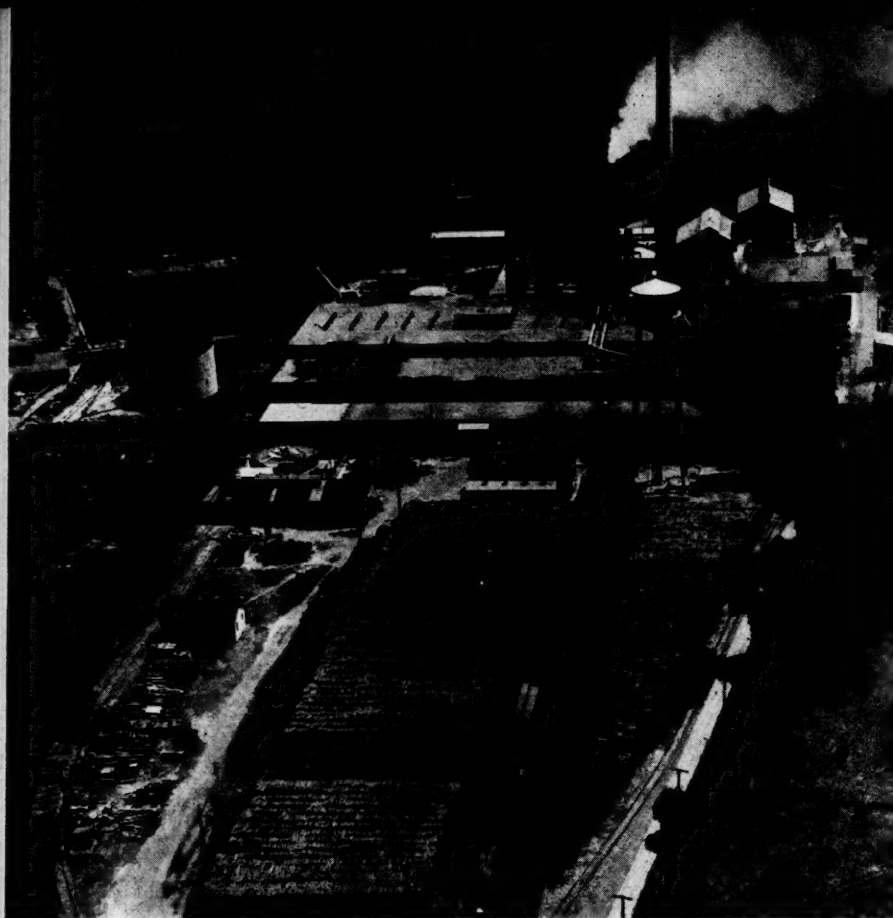
BY  
**Dr. A. Stuart Campbell**  
*Director  
Bureau of Economic and Business Research  
University of Florida*

terials for extensive lumbering, naval stores, and pulp and paper operations. Under its surface are found mineral deposits, which are being utilized in promising industries. In its lakes, which are estimated at 30,000, and in the waters surrounding its extensive coastline is found a fishing industry already important, and offering every indication of becoming

more so. It is well suited for manufacturing operations of many kinds, possessing varied raw materials, satisfactory power, a cooperative labor supply, and a growing market inside its boundaries and within reach of its transportation lines. However, the chief fame of Florida rests upon its matchless climate and prolific sunshine. These have been responsible for the annual advent of several million tourists, and the caring for these has led to the State's greatest activity, the tourist industry.

Florida has been developed comparatively recently, the State being largely undeveloped and sparsely settled as late as the beginning of the present century. Not much was known





*The pulp and paper industry of Florida, like that of the entire South, has undergone great expansion in the last few years with plants located at numerous points on Florida's long coastline. One of the largest of these plants is that of the National Container Corporation at Jacksonville, pictured here while the latest one, for the Florida Pulp and Paper Company has just started construction at Pensacola.*

about it then, and an idea commonly held was that the prevalence of malaria made it unhealthy. The Spanish-American War drew the attention of the nation to Florida, as the place from which most of our troops sailed for Cuba, and the chief base of supplies for the military operations there.

About this time the wealth of Florida's forests attracted investors and large lumbering and naval stores operations were started. Agricultural activities in citrus and winter vegetables followed. Attention was given to health conditions which became very satisfactory. Prosperous forest and agricultural enterprises were soon returning large profits to their owners. With the development of the State's resources trade became brisk. Manufacturing operations were started in various centers. The climatic advantages of Florida for winter visitors, and for year-round residents, began to be known throughout the nation, and tourists started flocking toward it in the cold seasons. Realizing the splendid potentialities of the state as the nation's winter resort, far-sighted business men laid the foundations for elaborate facilities for taking care of and entertaining these visitors. The four-fold economy of Florida was thus launched, in the fields of tourists, agriculture, manufacturing and commerce.

From the period of the world war to the present, Florida has enjoyed an era of expansion and development, equalled by few, if any of the other states in the nation. Its population increased by 52 percent between 1920 and 1930, which was the second greatest

increase of any state during this period. From 1930 to 1940 there has been an estimated further increase of 20 percent in the state's population. The income of Florida increased 330 percent between 1920 and 1930, compared with a rate of increase of 129 percent for the nation, in the same period.

During the World War and post-war period the trade from Florida ports to the Caribbean area expanded greatly. This was caused largely by the withdrawal of European trading interests, on account of the war. An ocean-car ferry from Key West to Havana, Cuba, constructed in 1918, handled an enormous volume of trade that was very important during the decade of the 1920's. Domestic coastal water trade, as well as foreign trade to many overseas areas, expanded during this same period.

Florida's growth was consistent until the land boom of the 1920's came along. Unfortunately, land values were greatly inflated during this period of over-optimism, and enormous developments were planned at high costs. The aftermath of this period is well-known. However, the people of Florida have profited by their experience in this period and sought to build their economy along sounder lines, which has resulted in the state now being on a firm economic foundation.

Economic activity in Florida has continued to center around tourists, agriculture, manufacturing and commerce. A satisfactory check-up has never been made to show definitely how much revenue is brought into Florida by the tourists. It has been estimated that be-

tween two and three million tourists come to Florida each year, and spend \$300,000,000 to \$500,000,000. This would make the tourist industry the most important economic activity in Florida, and the leader of its four-fold economy. Manufacturing has the next highest income of the activities in Florida, the total value of manufactured products in the state in 1937 being \$217,045,000. The value of all agricultural products produced in Florida in 1939, including livestock, dairy products and poultry, was \$139,343,000. Commercial activity tends to overlap the others to a certain extent, so data concerning it would not be comparable with those just given.

There are excellent reasons why Florida economy, if devoted to the wise utilization of the resources found within the state, should be sound and lasting. An analysis discloses that the following economic factors are favorable to the economic development of the state: location, climate, physical features, natural resources, and the energy of the population.

The location of Florida, which is in the same latitude as Northern Africa, Central India, or Southern China, gives it a near-tropical climate conveniently close to the temperate regions of the rest of the country. With mild winter temperatures ranging from 60° to 70°, Florida is particularly suitable for residence during the cold seasons. Florida is likewise pleasant during the summer months, the proximity of the ocean moderating extreme heat, and giving the state an average mean summer temperature of 80°, which is lower than most northern communities.

The location of Florida is important in another sense, in that it is nearer more of the Latin-American countries than any of the other states, and likewise closer to the southern and central parts of the country than ports on the North Atlantic. Florida ports have a five-day advantage in delivery time over New York for certain Latin-American countries. Florida may thus be a logical point of shipment in the distribution of products between the Middle West, as well as most of the South, and Latin-America. The state possesses the longest sea-water coastline of any in the nation, exceeding 1,200 miles, along which there are seventeen harbors and an ocean barge canal. Water transportation facilities are available for an enormous carrying trade. A promising ship-building industry is now underway in Tampa, which would seem to have a great future. The present emphasis on commercial relations with Latin America and defense of the Western Hemisphere should

increase the importance of the Florida peninsula, because of its strategic location in this connection.

The railroad facilities in Florida are satisfactory, with per capita mileage well above the average for the Southeast. Excellent train service to Florida is provided for passengers, with some of the outstanding trains of the nation, as far as comfort, luxury, and speed are concerned. The freight service is sufficient to take care of Florida shipments. Freight rates between Florida and northern points have been adjusted to eliminate some of the inequalities which existed between such hauls and those in northern territory, but further adjustment is needed to place them on an exact parity.

Air service connects Florida cities with all parts of the country. Pan American Airways has one of its largest fields at Miami, which is the point of departure for Latin-American routes. At Pensacola is located a United States aviation station and training school, while there is a naval air base at Jacksonville and an army air base at Tampa.

Among its natural resources, Florida's forests, of 22,365,000 acres, or three-fifths of the entire state, are very important. These forests have supplied the raw material for a number of prosperous industries of which lumber, naval stores, and pulp and paper are the most important. The value of all forest products produced in Florida in 1937 was \$54,557,000. Of this total, lumber comprised \$29,861,000, miscellaneous wood products \$16,745,000, and naval stores \$7,592,000. The bulk of the wood products consisted of materials used in building construction and fruit and vegetable containers. Of the lumber produced in Florida in this year 89 percent was softwood, and 11 percent hardwood.

With wise usage, Florida's forests should continue to be a source of important income

and cut-over land, of which there is a large total acreage due to previous unwise exploitation, may now be purchased very cheaply. Individuals with plans for developing it can obtain large tracts with a small capital.

Within the last few years five large pulp mills have located in Florida. These enterprises are prospering, and are furnishing desirable outlets for timber which is not required for other forest industries. The outlook is that more pulp mills will come to Florida, together with some that will produce white paper. The fast maturing slash pine found in Florida permits pulp and paper to be manufactured at a much lower cost than in northern areas. At the present time, naval stores producers are selling crude rosin and turpentine to northern plants, where finished chemicals are made and sold at relatively high prices whereas they could be made equally as well in Florida and thus keep the income from such operations in the state. The lumber and naval stores industries are suffering from a reduction in foreign buying at the present time. With a resumption of brisk export sales, these industries should offer an opportunity for development.

Another important natural resource of Florida is its actual and potential mineral wealth. The total value of the mineral production in Florida in 1937 was \$13,812,000. Of this total, phosphate comprised \$9,143,000, while limestone, lime and flint had a total of \$1,608,000, cement, diatomite and peat, \$1,414,000, and kaolin and fuller's earth, \$861,000, with other minerals having smaller quantities. Florida has been the lead-

*This plant of Rayonier Incorporated at Fernandina which started production early in 1940 is the first and only mill manufacturing rayon pulp from southern pine by means of the sulphite process.*

ing phosphate producing state since 1894, producing about three-fourths of the nation's total at the present time. A small quantity of this phosphate is used in the state, but the bulk of it is shipped to northern centers, where it forms the principal ingredient in fertilizer, some of which is shipped back to Florida agriculturalists. In view of the large amount of fertilizer used in Florida, there is a need for more plants to utilize a larger part of its phosphate in the making of fertilizer. Experts have stated that the supply of phosphate in Florida should last 200 years or longer. Fuller's earth, which is used for oil filtration and similar purposes, is found in satisfactory quantities in the state while a large industry might be built up to manufacture china, porcelain, tile, electrical insulators, etc., from the kaolin deposits. Building stones and clays are plentiful in Florida, and there would appear to be a good opportunity for a large expansion in the production of such building materials because of the brisk construction activity.

The many inland and coastal waters of Florida constitute the basis of a fishing industry that serves a dual purpose of making a strong appeal to the tourists, and of having an annual commercial output valued at \$7,952,000 in 1938. The commercial industry has developed into the leading fishing industry of any southeastern or Gulf state. Besides choice fish, other seafood products are obtained, such as shrimp (one-fourth of the national supply), and oysters and a unique sponge industry has been established on the west coast of Florida. The fishing industry needs better refrigeration equipment on the boats, and the development of more canning plants. With these additions, its possibilities should be unlimited. The value of canned sea food products is only one-tenth that of fresh fish in Florida.

The cigar industry ranks next to the forest





*Left—The Gliddens Naval Stores plant at Jacksonville is one of the largest such plants in the second largest naval stores producing states. Right—Brooks-Scanlon Corporation at Foley is not only one of the state's largest timber mills but one of the largest and most progressive forest operators.*

industries in value of output, this being \$24,972,000 in 1937. Cuban tobacco is used almost exclusively in the higher grades of cigars, while some domestic tobacco produced in West Florida goes into the cheaper cigars.

Other industries in the state include the food-products group, with a combined total value of products in 1937 of \$56,165,000. In this year the canning of fruits, vegetables, and seafoods resulted in products valued at \$16,735,000, while printing and publishing amounted to \$14,770,000 and the fertilizer plants had a gross product of \$14,392,000.

Agriculture has developed along distinctive lines, only about one-sixth of the state being used for agricultural purposes. Of a total area of 35,000,000 acres, just 6,000,000 are used for agriculture, and only about one-third of this planted in crops. The \$139,343,000 derived in 1939 from the 2,000,000 odd acres devoted to crops gives an average income of \$70.00 per acre, which indicates the intensity of Florida agriculture. Large expenditures for labor and fertilizer are necessary in the production of crops. There are 73,000 farms, with an average value of \$4,400, as compared with 251,000 farms in the average southern state, with an average value of \$2,500. The total number of farms is thus less than one-third of those in the average southern state, but the average value is more than 50% greater than the latter. Most of the farms are owned by their operators, the state being the second lowest in the South in farm tenancy. In 1939 citrus fruits made up 39 percent of the total value of agricultural production, with truck vegetables comprising 26 percent, and livestock and products 18.5 percent. Citrus and truck vegetables thus account for two-thirds of the agricultural income.

A crop that offers excellent possibilities for future production is sugar, which can be produced at a lower cost than in any of the other producing areas except Cuba, and only slightly more than in this section. Sugar quota restrictions have limited the production of continental United States to 30 percent of our total consumption, and Florida to 1 percent of this total. If this quota were removed, the industry in Florida could supply a substantial part of the entire needs of the country, at a lower production cost, at the same time giving employment to thousands of additional

workers, and spending large sums annually in the state.

Another possible activity is an extensive cattle industry. With an enormous quantity of land not being used for agriculture, or not being used for any purpose, there is abundant territory for cattle ranges. The main problem seems to be that of getting suitable perennial grasses to grow on these lands, and if this is solved satisfactorily, Florida might have a thriving and prosperous livestock industry, sufficient for its own needs and other parts of the southeast. At the present time there is produced in Florida only one-third of the meat consumed in the state. The dairy industry is likewise in need of development, and offers a promise for future expansion.

It is believed that while each of the major economic activities can and will be expanded, the greatest possibilities are in the field of manufacture.

The opportunities for further manufacture are excellent. Included among advantageous factors are a number of important raw materials, satisfactory labor, a very low fuel oil power cost, a warm climate which permits industrial operations to be carried on throughout the year with little or no expense for heating the plants, a fair market within the state, and transportation facilities to other sections by both water and rail.

Scientific industrial research to point out the ways in which various raw materials could be utilized, might result in the establishment of new industries which would soon be flourishing. The forest wealth of Florida might be converted into valuable plastic, textile, and chemical products. A plant in Pensacola is now making plastics, cleansing and medicinal preparations, perfumes and camphor, out of dead pine stumps while another plant is making rayon pulp from southern pine.

The processing and chemical conversion of agricultural products likewise offers possibilities for new manufactures. Power alcohol might be made commercially from some of

the starchy vegetables. Improved canning methods for fruits and vegetables might be perfected, as well as better canning and refrigeration methods for meat and sea-food products. Valuable uses of by-products might be found, such as the cattle feed now made from citrus pulp.

Individual products like ramie might be developed for a world-wide market. This plant grows prolifically, and has a very high tensile strength. Textile plants might be constructed to utilize Sea Island cotton. An effective method might be found for cleaning, curing and utilizing in the manufacture of valuable products, the Spanish moss found in abundance in Florida's forests. Plants like the palmetto might be used productively. The peat of the Everglades might contain valuable properties adaptable to commercial usage.

The people of Florida are of a very cosmopolitan type, coming from every state. The combination of northern and western people with native southerners has resulted in a population full of energy and initiative, co-operative with aggressive leadership, sympathetic toward new enterprises, and friendly to newcomers. The state as a whole is sparsely settled, the 1,657,000 inhabitants resulting in a population density per square mile of only 28 persons, in contrast with an average density in the other southern states of 42 per square mile, 270 per square mile in New York, and 544 per square mile in Massachusetts. The state's population is 70 percent white and 30 percent colored. About 11 percent of the people are of foreign stock, coming mostly from Canada, the British Isles and Cuba. Florida is the only southern state to have a greater percentage of its population urban than rural, in 1935 the urban proportion being 61.6 percent, with the rural proportion 38.4 percent. There are more than sixty cities in the State having a population in excess of 2,500, nine of these being over 20,000 population, and three over 100,000. The annual per capita income of Floridians in 1937 was \$434.

The combination of these various economic factors that have been discussed should lead to the rapid utilization of Florida's resources, and when this is done in a sound and thorough manner, the state should become one of the most prosperous in the nation.



# Florida—

## Its Material Assets for Future Industrial Development

**F**LORIDA, the "Land of Flowers," first discovered in 1513 by Juan Ponce de Leon, is unique among the states of the Union in a number of respects. With St. Augustine the oldest city of European origin in the United States, Florida has changed ownership no less than 13 times and its people have lived under the sovereignty of five different flags: Spanish, French, British, Confederate and United States. It was ceded to the United States in 1819.

Admitted to the Union as the 27th state in 1845, Florida, with a land area of 58,666 square miles, ranks 21st in size and 31st in population, the latter in 1937 being 1,657,000 or more than three times the population in 1900.

### Climate

**F**LORIDA from a climatic standpoint is sufficiently well known to require but little detail. However, though situated close to tropical latitudes, the climate is decidedly equable due to the proximity of the Atlantic Ocean, the Gulf Stream, and the Gulf of Mexico. The average annual temperature of 70.8° Fah., ranges from an average for January of 59° to a comparable average of 81.3° in July and there are seldom less than about 250 days entirely free from frost while killing frosts in the southern part are extremely rare. The average annual precipitation of 52.78 inches ranges from an average of 7.22 inches in July to 2.81 inches as the average for January.

### Transportation

**A**DEQUATE transportation facilities are among the principal requirements of industry. In this respect Florida leaves little to be desired. Of the 67 counties in the state, all but one are served by the railroads which have in the state a total mileage exceeding 5,000 miles. Passenger service between Florida and the metropolitan centers of the country with fast deluxe trains, are the boast of the railroads operating in the state. Similarly, the quantity and variety of agricultural and fish products demand the latest type of freight transport.

The highways of the state total approximately 29,550 miles of which 7,410 are state maintained and 11,870 are hard surfaced and others are under construction, the mileage of improved roads lengthening constantly as drainage of land proceeds and farms lands are extended.

With a tidal shore line of 1,277 miles, Florida far outranks any other state. At convenient distances throughout the length of this coast line are seaports with adequate shipping facilities for coastwise and foreign trade, while many ships make these ports their regular port of call. The total value of merchandise passing through the several customs ports in 1939 was \$32,341,000 and \$19,374,427 respectively for exports and imports. In addition there are numerous navigable waterways throughout the state.

Commercial airlines provide regular passenger and freight service not only to all parts of the United States but to several foreign countries, including most of South America.

### Manufactures and Finance

**I**N 1937, the latest year for which such statistics are available, Florida had 52,005 wage earners employed in manufacturing and the aggregate value of products was \$217,044,982, a gain of \$62,115,256 or over 40 per cent over the value for 1935. The principal manufacture is that of lumber and timber products with a value of \$29,860,617 giving employment to 15,400 wage earners. Cigar manufacturing is a close second with products valued at \$24,972,472 and employing nearly 10,000 individuals. Fertilizers, with an annual value of \$14,391,737, is also an important industry. The value of canned and processed fruits, vegetables, fish, etc., was \$16,220,558 and since 1937 a number of additional plants have been erected. The cost of materials, containers, fuel and purchased power for all manufacturers in the state amounted to \$113,137,975.

There were 170 banks in the state in 1939 with aggregate resources of \$438,107,000 and individual deposits of \$393,332,000. Capital stock of these banks including capital notes and debentures is reported as \$22,845,000 while savings deposits totaled \$74,085,000. The total bank clearing as reported by the Jacksonville, Miami, and Tampa exchanges was \$1,318,847,000 as against \$1,190,069,000 in 1938.

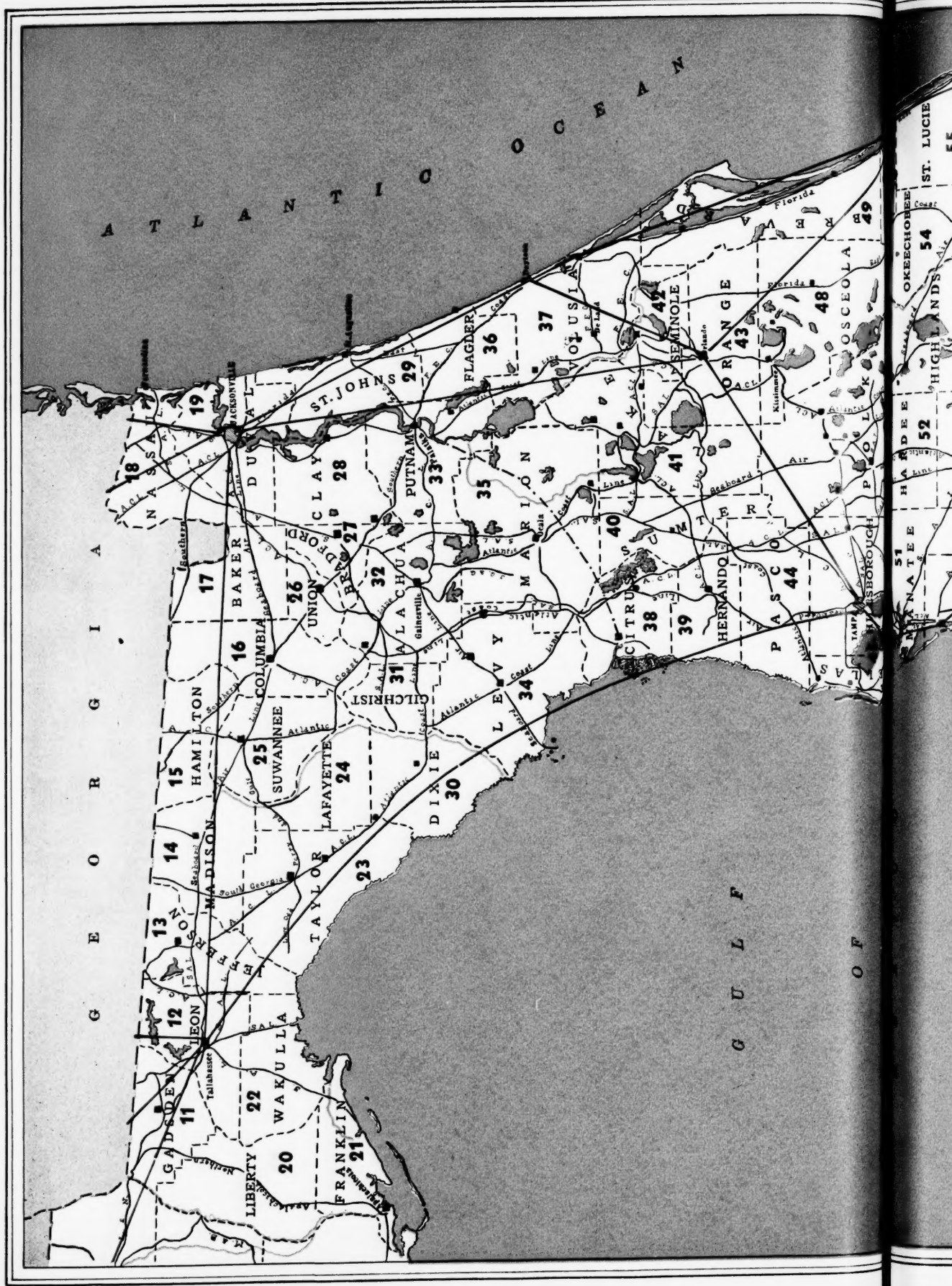
### Agriculture

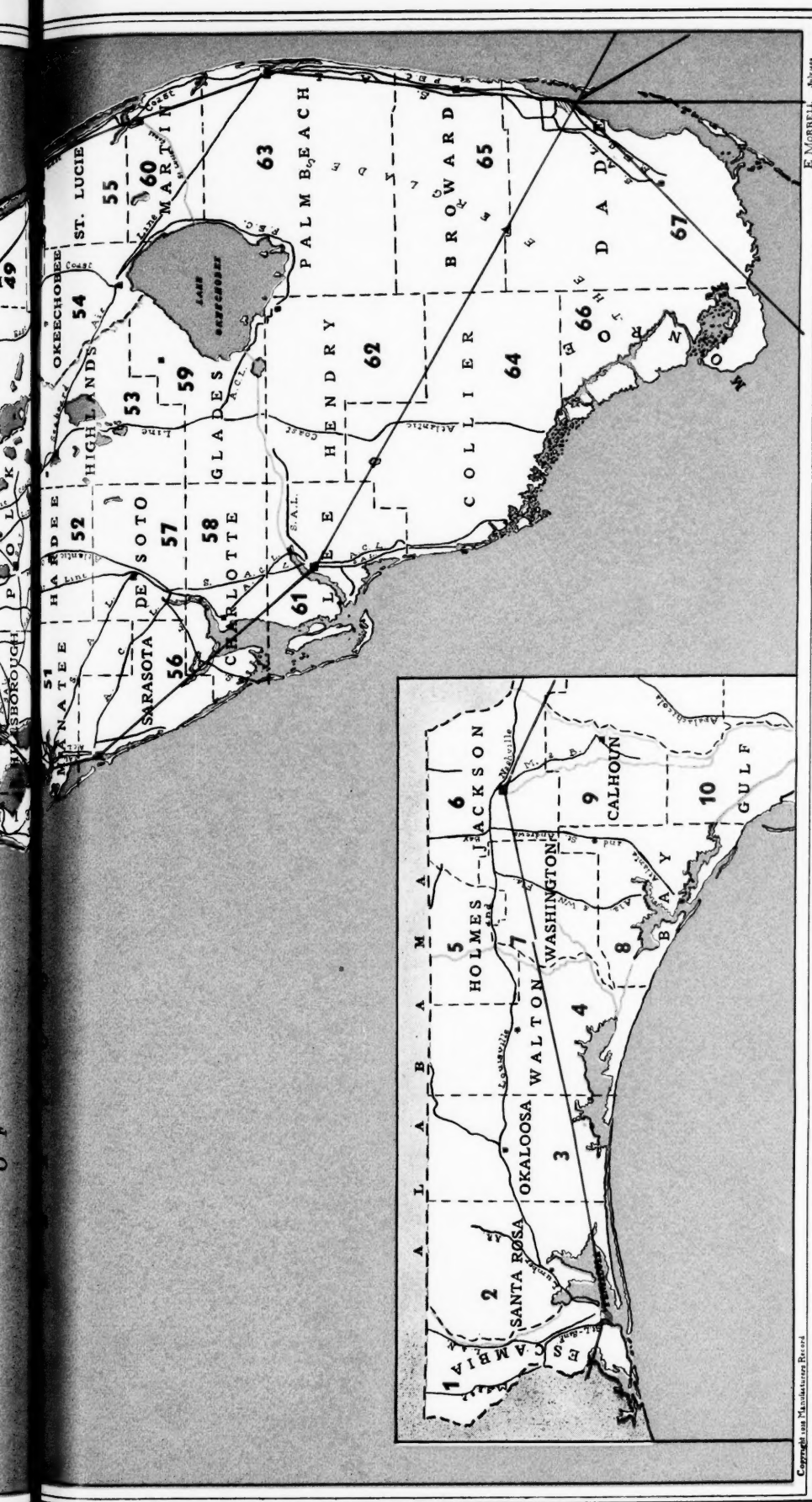
**W**ITH 6,048,000 acres in farm land representing only 17.2 per cent of the state's total land area, the aggregate crop acreage is 1,579,000 acres. The crop yield from this however produced a cash income of more than \$98,403,000 in 1939 or an average of approximately \$70.00 per acre which is nearly three times that of the national average. One of the principal items was truck crops which yielded an estimated income, from commercial and non-commercial sources, of \$39,982,000. Of this amount \$33,239,000 was derived from commercial market sales and \$95,000 from sales for manufacturing.

In addition, \$20,103,000 was derived from livestock and livestock products. In 1939, the total livestock in Florida totaled 1,473,000 and was valued at \$26,993,000 of which 821,000 were cattle worth \$17,133,000. The cash farm income from dairy products amounting to \$11,945,000 included \$2,587,000 from eggs, \$1,281,000 from chickens and \$7,689,000 from milk and milk products.

Although Florida because of its climate and soils is capable of and does grow virtually every farm crop including those of tropical origin, by far the majority of the cash income is derived from citrus fruits and truck produce. Production of the former is constantly increasing as evidenced by the gain of over

(Continued on page 108)





# FLORIDA

Its principal materials and transportation facilities offering opportunities for industry, with additional facts on the reverse side pertaining to industry and its growth within the state.

**Minerals**  
**Counties in which material is commercially produced**  
**Clay**—1, 2, 7, 8, 9, 11, 13, 23, 32, 36  
**Diatomite**—11

**Fuller's earth**—11, 35  
**Kaolin**—33, 41  
**Limestone**—6, 29, 30, 31, 32, 34, 35, 37, 38, 39, 40, 41, 46, 51, 56, 60, 61, 62, 63, 65, 67  
**Phosphate rock**—35, 38, 46, 47  
**Sand and Gravel**—1, 8, 11, 33, 41, 43, 46, 47, 55, 67  
**Timber**  
**Longleaf-slash**—1 to 12, 14 to 16, 22, 25 to 28, 30 to 35, 37 to 47, 51, 53, 56, 65  
**Longleaf-slash-cypress**—1 to 4, 8 to 10, 12, 13, 15 to 24, 26 to 37, 40 to 51, 56, 57  
**Slash-cypress**—53 to 56, 58 to 65, 67

**Agricultural Products**  
**Citrus fruits**—2, 6, 8, 23, 32, 33, 35, 37 to 47, 49 to 53, 55 to 61, 63, 67  
**Corn**—1 to 20, 22 to 44, 46 to 48, 50 to 54, 57 to 59, 61 to 63  
**Cotton**—1 to 7, 9 to 16, 24, 25, 32  
**Cypress-Hardwoods**—6, 10, 14, 20, 21, 23, 30, 33, 34, 37 to 42, 51, 64  
**Naval Stores**—1 to 44, 46 to 49, 51, 53, 54  
**Loblolly-hardwoods**—6, 7, 11 to 14, 22  
**Mixed bottomland hardwoods**—2 to 7, 9, 11 to 14, 18, 20, 23, 33, 35  
**Peanuts**—1 to 7, 9, 11 to 16, 22, 24 to 26, 30 to 35, 38 to 40, 44, 47, 63  
**Pecans**—1 to 9, 11 to 20, 22 to 28, 31 to 38, 41 to 43, 45, 46  
**Sugar cane**—1 to 6, 8, 11 to 14, 16, 20 to 27, 29, 30, 33, 36 to 41, 53, 54, 59 to 63  
**Sweetpotatoes**—1 to 20, 22 to 49, 51 to 54, 56, 57, 59 to 62, 65, 67  
**Tobacco**—2, 3, 5 to 7, 9, 11 to 17, 20, 23 to 27, 31, 32, 34, 35, 38  
**Truck crops & fruits**—1, 6, 8, 10, 14, 16, 25, 27 to 29, 31 to 33, 35, 36, 38 to 47, 49 to 52, 54 to 56, 62 to 65, 67

**Tung**—26, 32  
**(Small quantities of these products and soybeans are also produced in other counties.)**  
**Fisheries**—1 to 4, 3, 10, 18, 19, 21, 22, 29, 30, 37, 38, 39, 44, 45, 46, 49, 50, 51, 54, 55, 56, 58 to 67  
**Railroads**  
**Navigable rivers**  
**Proposed route of Florida Ship Canal**  
**Airlines**  
**Airports—also at principal cities printed in red**



## Florida

(Continued from page 105)

26,800,000 boxes or 87 per cent in oranges and grapefruits from the average of 1932-37 to 1938 where the total reached 57,500,000 boxes. Limes increased similarly from the negligible average quantity of 8,000 boxes in 1932-37 to over 95,000 boxes in 1938.

Great as Florida's citrus industry is, it is probable that truck crops will maintain an important position in view of the fact that three and four crops per year are not unusual. The value of truck produce in 1939 exceeded \$39,982,000 and the acreage devoted thereto increased approximately 20 per cent from the 1932-37 average.

In addition to the foregoing agricultural products the state grows a considerable quantity of other crops all of which offer numerous possibilities for industrial development. Outstanding among these are cotton, tobacco, corn, sugar cane and peanuts, production of which in 1939 was respectively 11,000 bales of cotton, 23,410,000 pounds of tobacco, 6,038,000 bushels of corn, 714,000 tons of sugar cane (for sugar only and exclusive of the large quantity grown for molasses), and 143,880,000 pounds of peanuts.

With continuance of the land drainage program and development of the state's innumerable waterways it is reasonable to assume that Florida's expansion of agricultural industry is only at the threshold.

## Timber

FLORIDA has 22,365,000 acres in forest land of which 21,850,000 acres are designated as commercial forest with a saw timber area of 3,320,000 acres old growth and 3,800,000 acres second growth, or a total of 7,120,000 acres.

The stand of saw timber on the commercial forest area, amounting to 23,440,000,000 board feet, is made up of 17,870,000,000 board feet of softwoods and 5,570,000,000 board feet of hardwoods. These in turn comprise 8,530,000,000 board feet of old growth softwoods, 9,340,000,000 board feet second growth softwoods, 4,480,000,000 board feet old growth hardwoods, and 1,090,000,000 board feet second growth hardwoods.

In terms of cords, the saw timber area contains 36,585,000 cords—19,115,000 cords of softwood and 17,470,000 cords of hardwood. If to this is added the cordwood area of 2,710,000 acres containing 7,650,000 cords of softwood and 2,505,000 cords of hardwood, or 10,155,000 cords together, the total supply of all timber on commercial forest land is 46,740,000 cords exclusive of the quantity on reforested areas.

The total lumber sawed in 1938 was 934,846,000 board feet of which 356,590,000 was softwood and nearly 20 per cent more was used for veneer. Florida is the country's third largest producer of laths and the number produced in 1938 was 44,599,000 while shingles totaled 25,060 squares. A considerable area of the central and south central counties are well suited to the production of timber for use as pulpwood.

Naval stores form one of the largest industries in Florida, the state's product being in excess of 26 per cent of the entire country's output. Since approximately 60 per cent of the world's naval stores originate in the United States, the value of Florida's contribution is large. During the crop year April 1, 1939 to March 31, 1940, there were 103,451 fifty-gallon barrels of gum turpentine produced.

## Mining and Minerals

THOUGH limited in the variety produced, Florida is an important non-metallic mineral state, the value of products having nearly quadrupled since 1900.

On the accompanying map are indicated those minerals which are commercially available and produced in substantial quantities at the present time. Among these, phosphate is the most important and comprises about 80 per cent of all phosphate produced in this country while the production of limestone is the second largest.

In addition to the minerals shown, several others are produced on a smaller scale while still more are known to exist and it remains for exploration to determine the size and quality of their respective deposits. The following are minerals which it is

anticipated will warrant attention for steady commercial production.

Dolomitic Limestone	Peat
Gypsum	Rutile
Ilmenite	Travertine
Others	Zircon

## Electric Power

THE electric power generating facilities of Florida which now have an installed capacity amounting to 415,491 kilowatts, increased 322 per cent between the years 1925 and 1929 and are at present adequate for all immediate demands. Steam power comprises the major part with 367,132 kilowatts from 32 plants followed by 51 internal combustion engine plants capable of developing 33,966 kilowatts and 4 hydroelectric plants with 14,393 kilowatts capacity.

During 1939, 1,149,900,000 kilowatt hours were produced compared with 1,015,150,000 kilowatt hours in 1938. Of this amount 1,118,333,000 kilowatt hours were produced by plants operated by fuels. The principal plants with their generating capacity are:

15 Florida Power & Light Co. steam plants	126,690 kilowatts
4 Florida Public Service Co. steam plants	28,850 "
2 Tampa Electric Company steam plants	35,000 "

## Taxation

SEVERAL years ago, Florida passed an amendment to the state constitution providing that "all industrial plants which shall be established in this state on or after July 1, 1929, engaged primarily during said period in the manufacture of steel vessels, automobile tires, fabrics and textiles, wood pulp, paper, paper bags, fibre boards, automobiles, automobile parts, aircraft parts, glass and crockery manufacturers and the refining of sugar and oils, and including by-products, shall be exempt from all taxation, except that no exemption which shall become effective by virtue of this amendment shall extend beyond the year 1948. The exemption herein authorized shall not apply to real estate owned and used by such industrial plants except the real estate occupied as the location required to house such industrial plants and the buildings and property situated thereon, together with such lands as may be required to warehouse, storage, trackage and shipping facilities and being used for such purpose."

Real estate taxes are based on millages levied by the state, not to exceed five mills with limitations for certain operating expenses. A constitutional amendment exempts homesteads, up to a valuation of \$5,000, from all taxation other than special assessments for benefits. According to unofficial estimates the assessed valuations upon which the millages are levied varies from about 50 per cent down, some counties running as low as 10 per cent.

The assessed value of taxable property in the state in 1939 was \$527,510,927.

## Labor and Wages

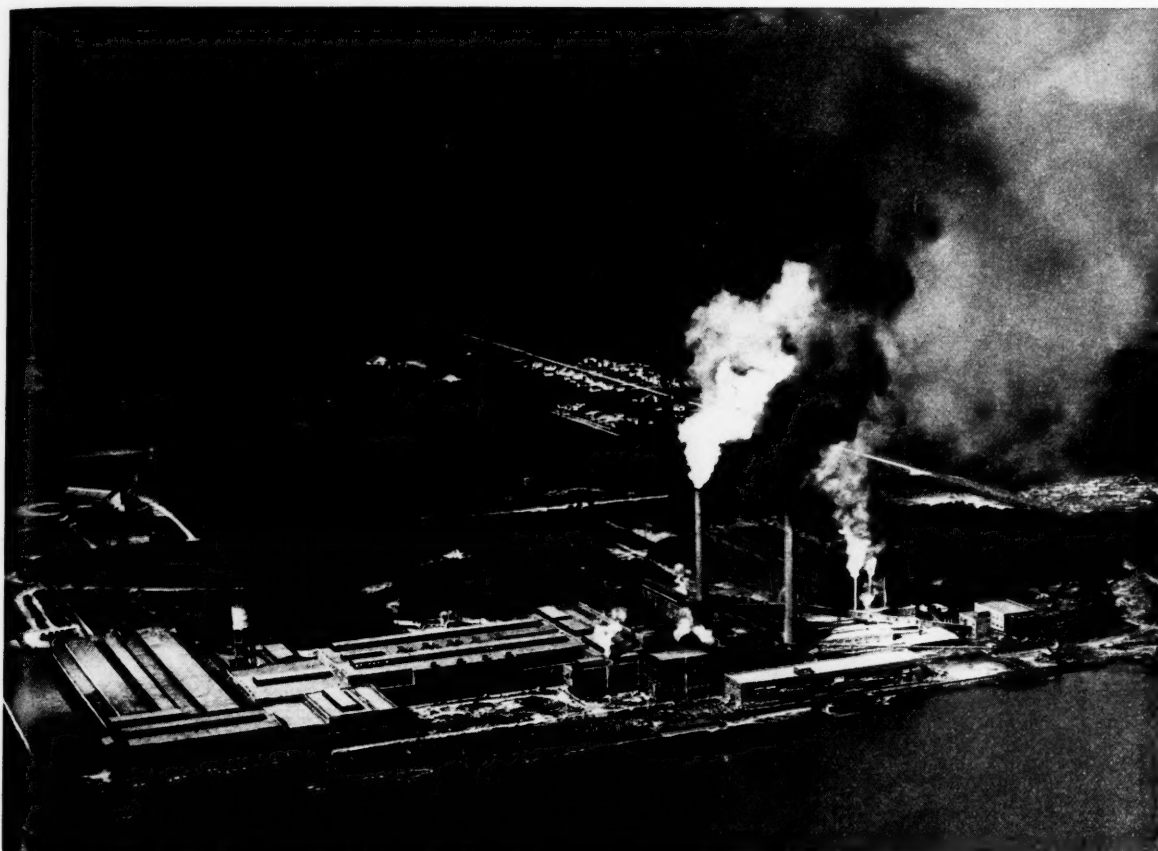
LIKE the other Southern states, the population of Florida is predominantly American born, the foreign born whites comprising only 5.7 per cent and those of foreign parentage are likewise small—5.3 per cent. The negro population is approximately 30 per cent of the whole.

Both skilled and unskilled labor is plentiful throughout the state and rates of pay are comparable with those prevailing throughout the South. Colored labor ranges from 10 per cent to 20 per cent lower than that for white labor while all rates vary to a certain extent from place to place particularly in the metropolitan areas as compared to the rural sections.

In the building industry skilled labor averages 85 cents per hour and unskilled labor from 35 cents to 40 cents hourly. In the pulp and paper industry, white skilled labor averages 60 cents per hour and unskilled labor is approximately half that amount.

The nine largest cities in the state in 1930 with their approximate populations are: Jacksonville, 135,000; Miami, 120,000; Tampa, 100,000; St. Petersburg, 42,000; Pensacola, 32,000; Orlando, 31,000; West Palm Beach, 28,000; Lakeland, 22,000; and Daytona, 21,000.

# GEORGIA



*The Union Bag and Paper Company's mill located on tidewater at Savannah is among the country's largest plants manufacturing kraft paper.*

## PROFITS IN GEORGIA INDUSTRY

**T**HE largest item in the industrial pattern of Georgia is textile. Cotton manufacturing has the longest continuous history of any of the 152 industrial types operative in 1937. The different types of textile plants produced 39.03 percent of the total value of industrial products. They employed 50.92 percent of all industrial wage earners, and produced 43.73 percent of the value added in manufacture.

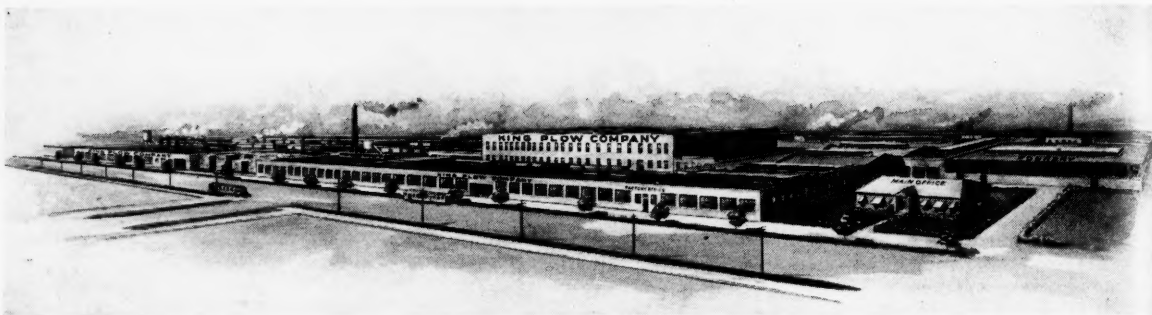
Moreover, the textile industry in Georgia has more satisfactory operating ratios than either the United States as a whole or any textile state outside of the South. For example, in 1937, an expenditure of \$100 for labor in

BY  
**W. Harry Vaughan**  
*Director,  
State Engineering Experiment Station,  
Georgia School of Technology,  
Atlanta, Georgia*

the broad cotton woven goods industry produced a "value added" of \$159.85 in the United States. For Georgia, the corresponding 1937 figure was a "value added" of \$189.20. The advantage possessed by Georgia, reflected in these ratios, is primarily due to the immediate accessibility of cotton. Closely

related to this is the availability of electrical power at relatively low cost, and the existence of a moderate climate which reduces the cost of both temperature and humidity control.

Furthermore, there are definite signs that Georgia is becoming a textile area, rather than merely one of cotton manufacture. Rayon is steadily becoming more important, not alone through exclusive rayon textile plants, but through a tendency for the more progressive mills to produce fabrics from mixed yarns, incorporating such fibers as rayon, cotton, flax and, recently nylon. Glass fiber is also processed in Georgia. The woolen woven goods industry is expanding and shows much the



Usually regarded as an agricultural state, Georgia has an unusual variety of industries that exemplify the trend of establishing plants either adjacent to raw materials or to the market. Pictured here is the King Plow Company plant at Atlanta where a wide variety of agricultural implements are made for state and southern markets.



Above is the Martha Mill, textile division of the B. F. Goodrich Company located at Silvertown where is made the textile fabric for tires. Below is the Brunswick plant of Hercules Powder Company, producers of naval stores and other products from pine tree stumps.





GENERAL  
JAMES EDWARD OGLETHORPE



*whose vision and courage founded the colony out of which grew Savannah and Georgia—the Empire State of the South*



SAVANNAH



AUGUSTA

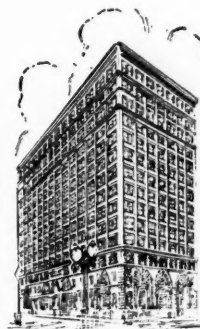


MACON

**P**IONEER in the industrial and agricultural development of the Southeast—possessing a background of more than half a century of intimate relationship—operating today in thirteen cities of Georgia and South Carolina—this bank literally *"grew as Georgia grew."*

Today Georgia is dotted with enterprises which stand as monuments to constructive banking cooperation with men whose leadership and vision helped to capitalize the natural resources of this *"the nation's last industrial frontier."*

Businessmen in the South or those considering the possibility of locating in this area are invited to visit our bank and confer with our officers. Our collective experience and financial cooperation are always available for the benefit of the South.



ATLANTA



ATHENS



VALDOSTA

## THE CITIZENS & SOUTHERN NATIONAL BANK

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AUGUSTA  
VALDOSTA

*Our affiliate banks in Albany, Dublin, LaGrange and Thomaston, Georgia and in Charleston, Columbia and Spartanburg, South Carolina, unite to provide the most comprehensive banking system in the South with resources totalling more than one hundred and twenty million dollars.*

*This bank is a member of the FEDERAL DEPOSIT INSURANCE CORPORATION*

same "value added" advantage of other textiles, even though there is as yet little wool produced in Georgia.

Textile research has made definite contributions to this tendency toward higher quality fabrics. The State Engineering Experiment Station, in its studies of correlative speed, strength, and uniformity factors in the cotton drawing process, has added a progressive step to the industry. In cooperation with the Tennessee Valley Authority, an attempt is being made to process flax by mechanical decortication and chemical degumming so as to economically produce a "cottonized" raw material suitable for spinning on cotton textile machinery. It is expected that this "cottonized" fiber will find an ultimate place in mixed-fiber fabrics such as suiting, dress goods, draperies, tablecloths, napkins, towels and sheeting. An X-ray study of the micellar structure of viscose and acetate rayon is expected to add considerable information to the control of textile properties of these artificial fibers produced from a cellulose base. The public, to some extent, is aware of the developments in rayon and cotton tire cord initiated by private research in Georgia industry. Such individual or cooperative efforts have begun to characterize a progressive attitude within the Georgia textile industry which underlies continued prosperity and progress in the future.

Between 1935 and 1937 there were definite volume increases, usually accompanied by improved operating ratios, for many of the textile specialty groups such as yarn and fabric dyeing, finishing and the production of clothing.

Closely related to cotton, are other cellulose industries for which Georgia affords similar economic advantages. Outstanding in this group is the pulp and paper industry.

In contrast with the textile industry, where the investment per employee is between \$1500 and \$2500, the pulp and paper industries have an investment per employee many times as large. While pulp manufacture shows only a fractional advantage for Georgia on the basis of average operating ratios,<sup>1</sup> finished

paper production, which employs a much larger number of skilled workers and technicians, shows highly advantageous ratios for Georgia and other Southeastern States. The probable effect of this situation will be to attract the development of paper finishing plants in this area during the next ten years. Necessarily this result will be somewhat slow because of the high investment factor.

As a predictable matter of the future, one must consider the probable development of cellulose type plastics. The primary economic reason for the expansion of these industries in Georgia is that this area can produce cellulose either in the form of trees or annual farm crops at a more rapid rate than elsewhere.

The availability of competent technically trained personnel in Georgia will have an accelerating effect on this movement into the area of finishing industries of all types, thereby making more profitable the already existing production of raw materials and semi-finished goods.

The ceramic industries represent another group in which the natural resources of Georgia, the climatic advantages and the existence of both local and regional markets, constitute the basis for an industrial development of a profitable character in the very near future. The state of Georgia alone represents an annual ceramic market of approximately \$14,000,000 with a local production of about \$4,000,000, most of which is in the form of brick and other structural clay products. In addition to this Georgia market, there also exists a regional market, not served by local industries, which totals approximately \$63,000,000 for glass, (both sheet and container,) fire-brick and other refractory shapes, electrical porcelain, and for the three major branches of the whiteware industry, porcelain, semi-porcelain, and sanitary ware.

Natural gas at 20 cents a thousand feet is available for kiln operation, an advantage of

importance equal to these regional and state markets, which advantage may even overshadow in economic importance the geographical concentration of all the major raw ceramic materials in Georgia, North Carolina, Tennessee, and Florida. In addition to the foregoing prospects, there seems to be definite possibilities of the development of a Georgia rock wool insulating materials industry.

The food processing industries likewise afford excellent opportunities for large developments, particularly in canning, quick freezing and meat packing. The meat packing industry appears favorable in view of the accelerated rate of growth in the production of quality live stock, which has been in evidence for the past five years. Development in these fields, which would have the effect of improving the income status of farm population, should also have sufficient effect upon both total income and retail sales that one might logically expect these rising totals to provide averages corresponding with the United States as a whole.

The investigation of economic and operating ratios, previously referred to, also indicates that at many points in Georgia there are excellent opportunities for the development of fabricated machinery industries and others which would use metal produced in the region. The LeTourneau road machinery plant at Toccoa, Georgia, affords a recently-established example.

The doubling of the production of electrical machinery between 1935 and 1937, and the present expansion of the Western Electric plant in Atlanta is a further indication of this.

Several significant developments have taken place in Georgia during the last five years. These include the movement and improvement of the cotton textile, rayon, and pulp and paper industries already referred to; the establishment of a non-profit Industrial Development Council; the advent of a Citizens' Fact Finding Movement, which, through a group of authorities, is "opinion finding" solutions for Georgia problems on such subjects as natural resources, agriculture, industry and commerce, health, education, public welfare, penal system, tax system, and federal activities; the operation of an active En-

*The Bibb Manufacturing Company's Columbus mill at Macon is one of Georgia's largest textile mills equipped with 125,000 spindles and 254 looms.*

<sup>1</sup>"Investigation of Industrial Types Suitable to Georgia and the Southeast" under the direction of Joseph B. Hosmer, Industrial Economics Research Fellow, State Engineering Experiment Station.



# PORT WENTWORTH

## OFFERS INDUSTRIAL ADVANTAGES of HIGHEST IMPORTANCE

Consider these **TEN** outstanding points!

AVAILABILITY OF RAW MATERIALS :: PROXIMITY TO MARKETS :: PROTECTED HARBOR ::  
TIDEWATER SITES :: LOW TAXES :: LAW ENFORCEMENT :: LOW LIVING COSTS :: EQUABLE  
CLIMATE :: EXCELLENT TRANSPORTATION FACILITIES :: FREEDOM FROM LABOR DISPUTES

**P**ORT WENTWORTH, an unincorporated town, is just north of the Savannah city limits, fronting on the deep water of the Savannah River. It covers over 4,000 acres and its inherent industrial advantages are combined with living advantages of Savannah and the Port of Savannah where there are no cargo jams or congestion, vantage points in these times for Atlantic Coast shipping for exports and imports. For shipping from internal points, it has advantages over Gulf ports, saving time for European trade obviating the necessity of time consumed going around Florida.

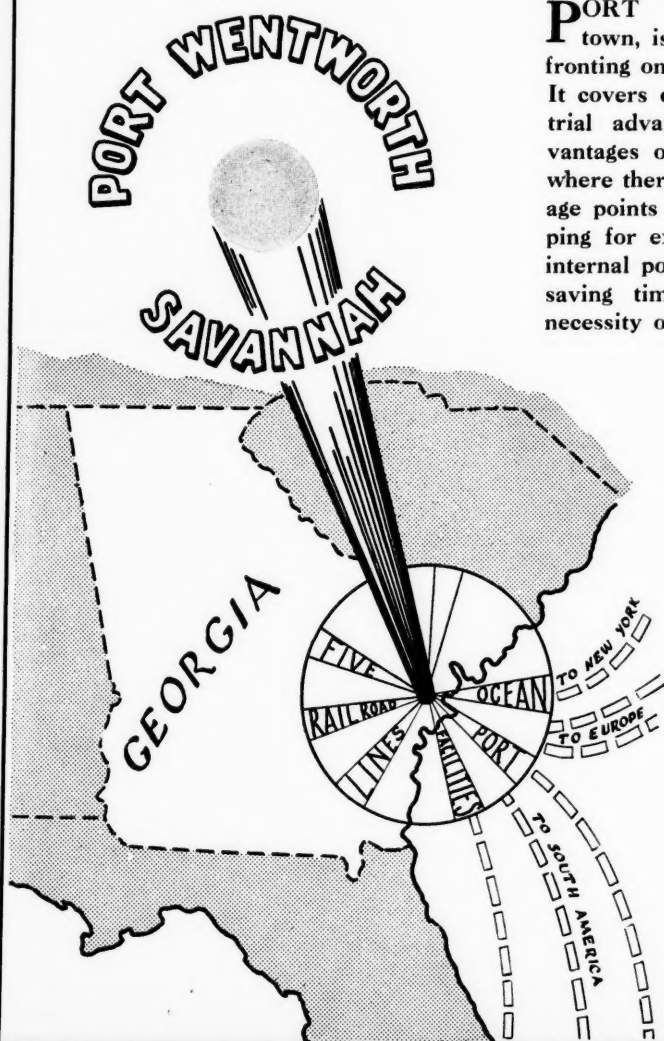
The natural resources of Georgia are available at Savannah's door. Millions of acres of pulpwood for paper and rayon, wood for furniture are within a few miles. Tung oil and soy beans—naval stores—abundance of farm products for chemurgic industries—almost every mineral of commercial value, all combine to make Port Wentworth an economic location for many types of fabricating industries.

When loyal and competent labor is essential in the national program of preparedness and defense and for normal activities, Port Wentworth offers industry a setting in a State whose population is over 99% American born. Public sentiment is opposed to strikes and all foreign "isms." Among the 135,000 population from which labor is drawn there is an abundance of skilled, semi-skilled and common labor available.

Electric power rates in Savannah are lower than any other steam operated power on the Atlantic Coast from Baltimore to New Orleans and compare favorably with all hydroelectric rates in the Carolinas and Georgia.

Some of the industries located in Port Wentworth:  
National Gypsum Company :: Union Bag and Paper Company :: Savannah Sugar Refining Company :: Certain-teed Products Corporation :: Pan American Petroleum and Transport Company :: Savannah River Lumber Company :: Dixie Asphalt Products Company :: Savannah Wire Cloth Mills :: Savannah Warehouse and Compress Company :: Pacific Coat Hanger Company :: Savannah Creosoting Company.

Located for efficient distribution of industrial traffic.



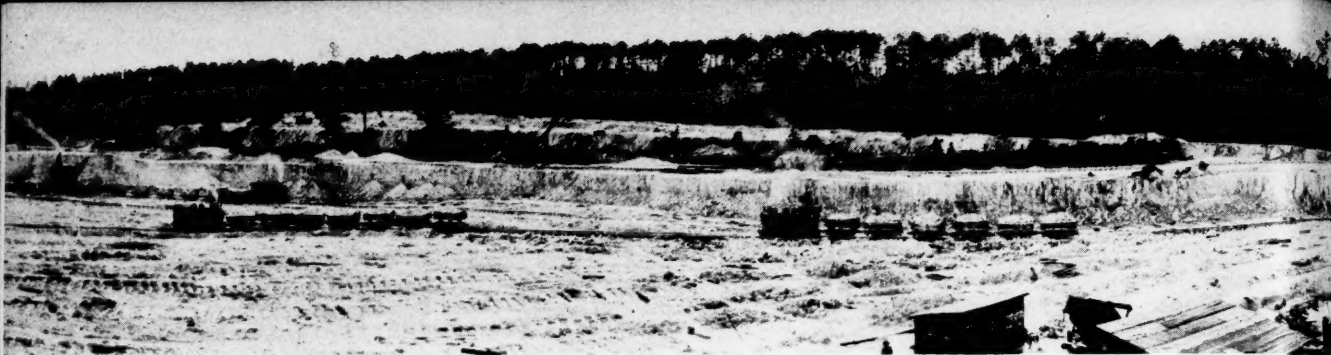
### PORT WENTWORTH CORPORATION

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NEW YORK, N. Y.

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SAVANNAH & ATLANTA RAILWAY

SAVANNAH,  
GEORGIA





gineering Experiment Station at the Georgia School of Technology; and the coalescence of forces behind the development of a series of Industrial Research Institutes. Moreover, Chambers of Commerce in Georgia have largely abandoned "bally-hoo" for attainable worthwhile objectives. The Tennessee Valley Authority (a part of Georgia is in the TVA area) has a working grasp of regional problems more basic than considerations of either power or flood control.

That Georgia is improving its industry with respect to quantity and quality may be seen from the following table:

Year	Establishments	Value of Products	Value Added
1935	2,858	\$523,290,000	\$187,248,000
1937	2,875	708,650,000	269,507,000
1939 (est)	3,004	941,100,000	376,500,000

The increasing ratio between "Value Added" and "Value of Product" indicates the increasing economic quality.

The 1939 investment in Georgia industry is estimated to be between \$750,000,000 and \$1,000,000,000.<sup>2</sup>

To picture what has been taking place recently, of the 340 classifications in the 1935 Census of Manufactures, 2,858 establishments included plants in 138 classifications. In 1937, the 2,875 Georgia establishments covered 152 classifications out of 350 in the Census. This is a testimonial to the diversified nature of industry growing and continuing to exist in Georgia following the depression.

With an eye to the industrial future, perhaps the finest endeavor under way in Georgia is the work of the Industrial Development Council. This Council, through research at the State Engineering Experiment Station, Georgia School of Technology, is carrying on an economic and technological investigation of proper industrial types for Georgia and the Southeast.

From the 1933, 1935 and 1937 Census of Manufactures, information is being analyzed regarding the cost of raw materials, personal

<sup>2</sup>Estimates by Joseph B. Hosmer, *ibid.*

*Georgia, largest producer of clay in the South, possesses many large and fine deposits of kaolin clay. Total production of all clays aggregates close to half a million dollars annually. Pictured here is a part of Edgar Brothers Klondyke Mine at McIntyre and nearby is the same company's plant where employment is provided for large numbers in the preparation and manufacture of this raw material.*

services, power, processing, value of product and other factors on a nation-wide basis. The increase in value resulting from manufacturing operations is also being carefully analyzed, so that a gross margin is determined for the individual industry on a nation-wide basis as compared with that available in Georgia and other Southeastern States. Those industries which show a higher gross margin available for operation in Georgia and the Southeast will constitute a preliminary list subject to intensive investigation.

Subsequently, an analysis of economically available markets and a technologic analysis of processing costs will be made. After such investigation, industries which then appear to have a higher gross margin when operated in Georgia and the Southeast are to be the subject of a series of economic and technological prospectuses. These prospectuses will not only include the above-mentioned facts, but will also indicate practical locations and include the capital structures required for operating until the new enterprises shall have achieved stability.

It is expected that the first of these prospectuses, "Food Preservation by Canning, Quick Freezing, and Dehydration," will be

*While most people know that Georgia has a large cotton textile industry, it is not generally realized the great variety of products manufactured. This mill of the Chicopee Manufacturing Corporation at Gainesville is one of the state's largest producers of tobacco, cloth and surgical gauze.*

published immediately. Following is a preliminary or tentative list of possible profitable industries showing a higher gross margin during both 1935 and 1937 in Georgia than in the nation as a whole:

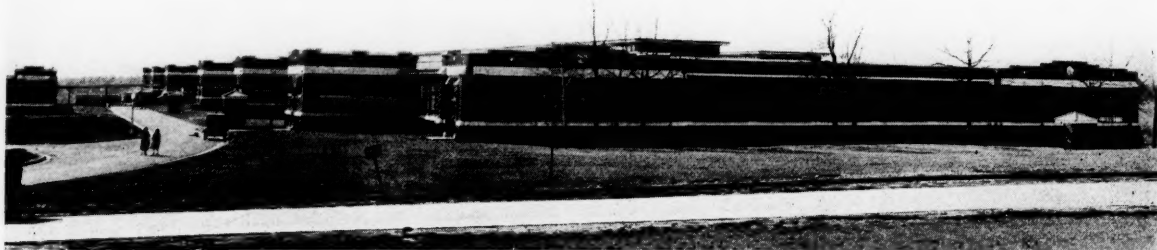
Foundry Products	Photo-engraving
Hosiery	Marble—Granite
Electrical Machinery	Sign and Advertising
Planing Mill Products	Novelties
Woolen Goods	Cotton Goods
Sheet Metal	(over 12" wide)
Bakery Products	Minerals and Earths
	Ice
Shirts—Nightwear	Clothing, Workshops
Cooperage	Mattresses and Bedsprings
Paper Goods	Nonferrous Metal Products
Canned Fruits and	Beverages, Non-alcoholic
Vegetables	Tanning Materials
Fertilizer	Drugs and Medicines
Turpentine and Rosin	
	Sausage and Meats
	Meat-packing, Wholesale

What lies in the future? We can deny neither the obligation nor the desire to guide our own future destinies. It is unthinkable to transplant industries to a section where markets do not exist or where the industry does not have a satisfactory relation to the customs, habits, and traditions of the people or to the situations which surround them. In the industrial development of the south, and Georgia in particular, control of a growing pattern of industrial development should be exercised. But this control should be positive, stimulating and generating initiative.

It is important that we determine the character of industry to be developed in our section by careful analysis, stimulation, and direction. The most desirable type of industry will,

- be indigenous,
- operate upon income or reserve raw materials,
- produce products which may be marketed both locally and at great distance,
- produce products having a high "value added" over the cost of raw materials,
- be adequately financed by local capital wherever possible.

If the new dynamic economics of plenty and the opportunities implied are taken to heart, the South may assist in raising the standard of living throughout the nation.



# The South IS RICH...

From an Editorial in  
*The Wall Street Journal*,  
January 6, 1940

*The South Is Rich*

Not long ago the country was told on high authority that the South was its great economic problem. But every reader of yesterday's issue of *The Wall Street Journal*, in which the greater part of 30 pages was devoted to exposition of that section's natural resources and its industrial development for their utilization, must revise whatever impressions of the South he may have based upon a too hasty generalization.

For the South is in fact a rich section of the United States—rich in the extent and particularly in the variety of its soil and mineral resources; rich in the eagerness and energy of its people, in their devotion to the welfare of their local communities. If the belief lingers among us that Southerners live in dreamy retrospect of a vanished golden age or that the youth of the South is softened by year-around sunshine, it is high time that we squared our ideas with a very different reality. Regarded as a whole from an historical point of view, industry in the South is comparatively young. Doubtless there are some disadvantages in its youth, but there are also important advantages in the flexibility that lies in recent beginnings, in the resultant ability to meet changing conditions in these days of accelerated change in production methods and market demands. Accordingly, we find that one of the most modern of industries, chemical production, has moved and is moving vigorously into the South. It may not be too much to say that industrial chemistry and the industrial South are growing up together.

## Capitalize Your Southern Opportunity

—Benefit by the Cooperation of  
*The Southeast's First, Oldest  
and Largest National Bank*

Truly the South is rich—rich in resources and in productivity, rich in the opportunities it presents.

Solve *your* Southern problems, capitalize *your* opportunities in the nation's newest and fastest-growing industrial empire, by utilizing the cooperation of The First National Bank of Atlanta . . . the Southeast's first, oldest and largest national bank, a financial landmark in this rapidly advancing region since 1865.

Among the 145,000 customers of this 75-year-old, \$135,000,000 institution are 85% of all the national corporations doing business in Atlanta, who know from experience the value of The First National's far-reaching and important contacts, its intimate knowledge of conditions, markets, opportunities throughout this section. Profit by their example—take up your Southern problem with The First National Bank of Atlanta now, in confidence and without obligation.

## FIRST NATIONAL BANK ATLANTA

FOUNDED 1865—CAPITAL, SURPLUS AND PROFITS \$10,000,000

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**WEST POINT MANUFACTURING COMPANY**  
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**COTTON FABRICS**

SELLING AGENTS

**WELLINGTON SEARS COMPANY**

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CHICAGO

PHILADELPHIA

ATLANTA

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NEW ORLEANS

*Southern Manufacturing*

*requires*

*machinery, materials, fuel, electric energy*

**P**RODUCTS made in the South reach the annual value of \$11,455,000,000 and the materials, fuel and electric energy call for an expenditure of \$7,230,456,000.

Here is a market for alert manufacturers to consistently cultivate, and to make known their products and services.

Details of current new projects and expansion of established plants are reported by the MANUFACTURERS RECORD and advertisers receive this service at no additional cost.

Advertising budgets and schedules for the fall, winter and for 1941 should include adequate space and monthly insertions in the MANUFACTURERS RECORD.

*Write for advertising costs, sample copies of our regular issues and any needed information.*

**MANUFACTURERS RECORD**

*Published monthly*

**BALTIMORE, MARYLAND**



**CATTLE RAISING...TIMBER-GROWING...FISHING AND HUNTING**

## **31,000 Acres near Albany, Georgia**

**Whole or Sub-divided, at a Low Price**

---

**IMPROVED      FENCED-IN      ON PAVED ROADS**

---

As a side line to our lumber operations this company has, during the past seven years, transformed a wilderness into a paradise on partially cut-over lands.

The seeding of pastures for cattle and wild life, the maintenance of fire breaks, the building of roads and bridges, and the prevention of fires and trespass have been at the expense of a cattle account that shows a profit.

This property of approximately 31,000 acres is so constituted that it can be operated as a whole or can be subdivided into 8 different parcels of from 750 acres up with competent improvements, all adjoining paved roads 8 to 16 miles from Albany, the metropolis of Southwest Georgia.

Wild life, protected for several years, offers the best hunting and fresh water fishing to be found in the Southeast. *Reforestation* grown on lands best suited.

The cattle industry has proven capable of showing a profit, leaving the timber growth and recreational advantages for profit.

### **MUST BE SOLD**

The sale of these lands is necessary to liquidate the interests of two estates in this corporation, and prices for the whole or parts thereof will be low to anyone really interested. We will discuss prices and terms with anyone who is interested to the extent of making a personal inspection, which can be done by automobile in one day's time from Albany, as about 34 miles of maintained roads and smooth, open fields make this possible.

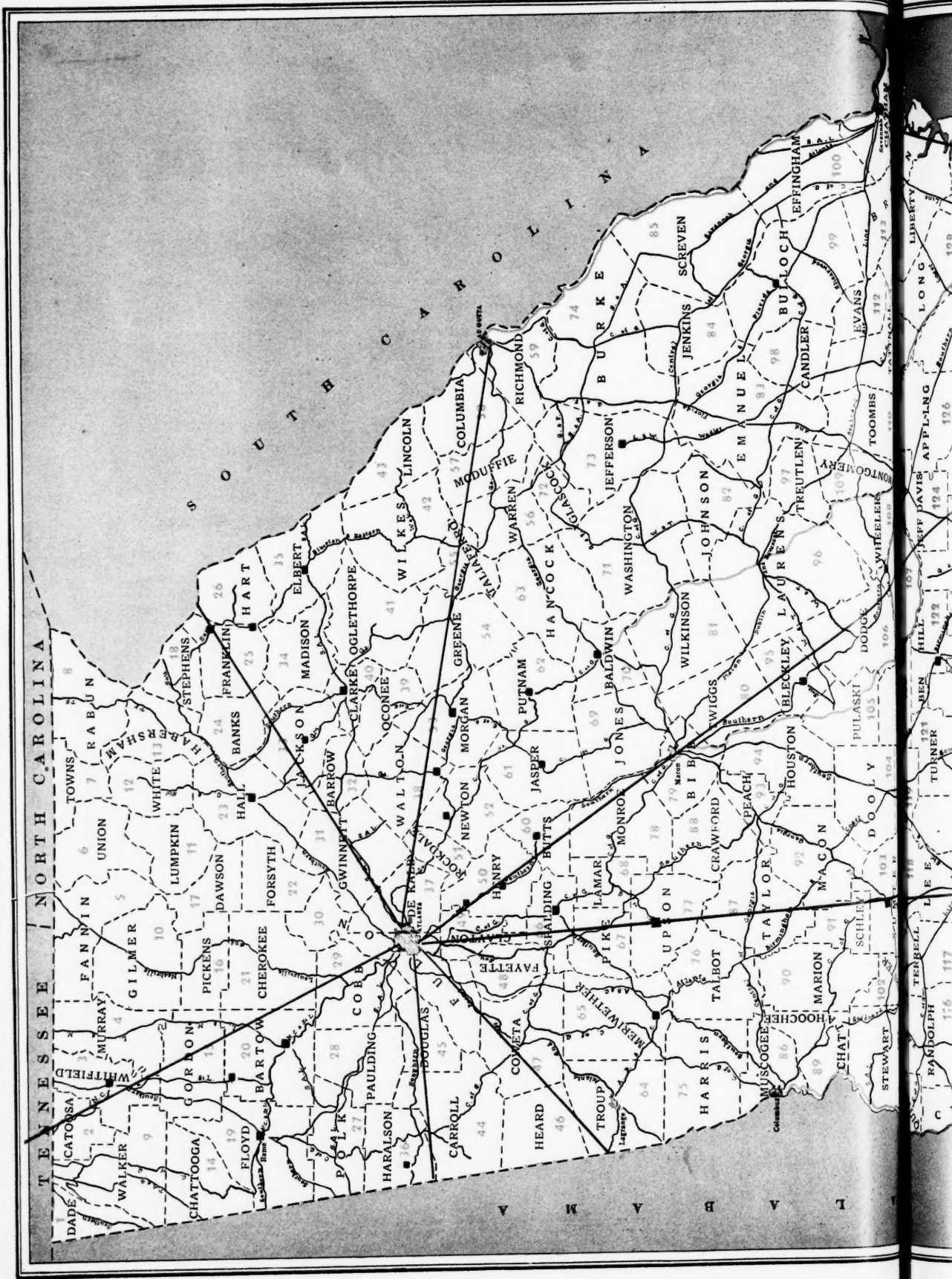
If interested in recreational, timber growth and/or cattle investments, we have all (3 in 1) and at low prices for reasons above mentioned. Will be glad to contact you.

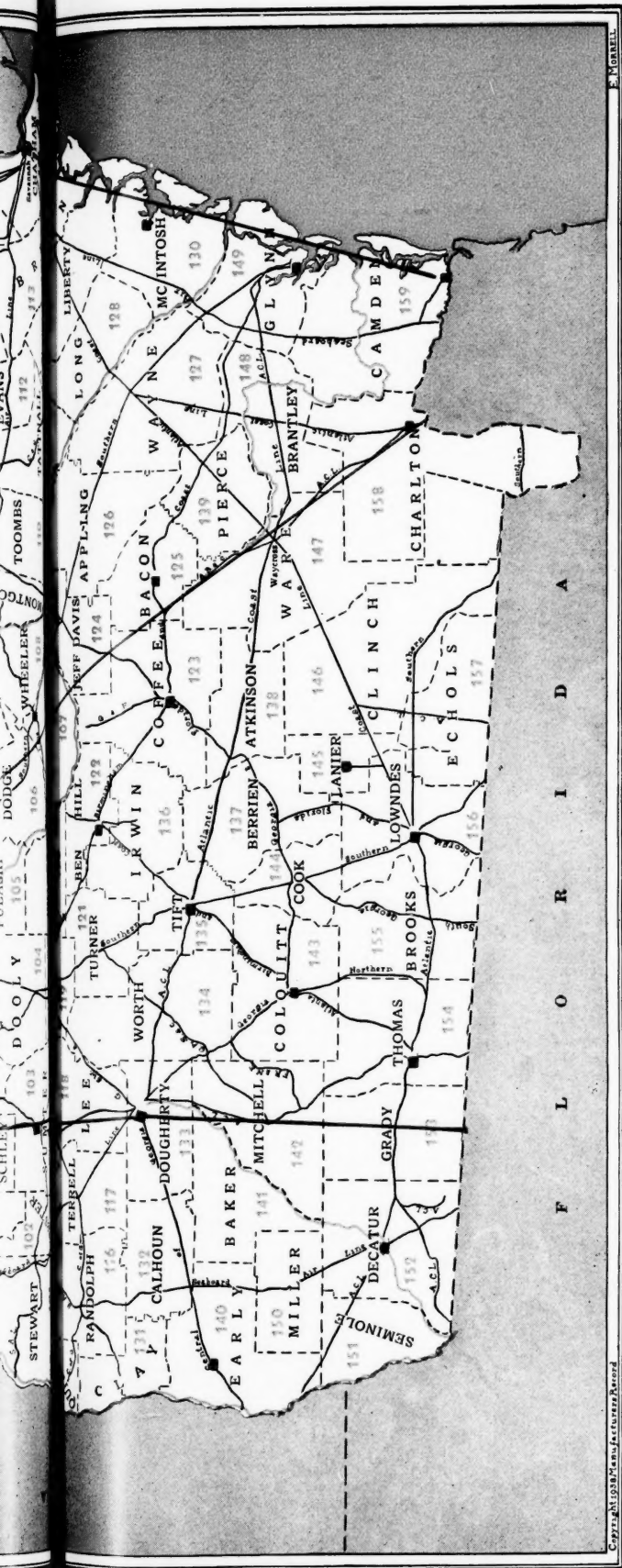
This property is practically all fenced and cross-fenced.

**REYNOLDS BROS. LUMBER COMPANY**  
**ALBANY, GEORGIA**

---

*"The South's Resources Need Capital and Men to Develop"*





# GEORGIA

Its principal raw materials and transportation facilities, with facts on the reverse side pertaining to its industrial growth and opportunities for industry.

**Mineral**      **Counties in which mineral is commercially produced**

- Barite—20
- Bauxite—20, 31, 103
- Clay—1, 3, 9, 12, 14, 15, 19, 20, 23, 24, 29, 37, 59, 70, 71, 79, 96, 137, 151
- Coal—59
- Crushed stone—37, 50
- Fuller's earth—30, 31, 152, 151
- Flagstone—3, 16, 29
- Gold—3, 11, 13, 17, 21, 22, 23, 31, 43, 57

- Granite—1 to 3, 11, 13, 16, 24, 28 to 31, 34, 35, 37, 41, 43, 44, 50, 51, 56, 58, 60, 63, 75
- Graphite—13
- Iron ore—9, 20, 27
- Kaolin—59, 63, 70 to 72, 80, 81, 87
- Kyanite—13
- Lime—19, 20
- Limestone—2, 3, 3, 10, 15, 16, 19, 20, 27, 91, 95, 133
- Manganese and manganese ore—11, 19, 20, 43
- Marble—16, 21
- Mica and micaceous minerals—13, 16, 21
- Ocher—30
- Portland cement—20, 27, 91
- Sand and gravel—12, 20, 30, 56, 59, 61, 76, 85 to 89, 107, 108, 111, 123, 130, 140, 151, 157
- Slate—13, 20, 27
- Talc and soapstone—1
- Tripoli—11

## Timber

- Longleaf-slash—71, 82 to 99, 101 to 112, 118 to 124, 126, 131 to 146, 149 to 151, 156 to 159
- Longleaf-slash-cypress—99, 100, 111, 113, 123 to 130, 137 to 159, 155 to 159
- Shortleaf-hardwoods—1 to 20, 22 to 27, 31 to 35

- Shortleaf-loblolly-hardwoods—3, 4, 14 to 16, 19 to 21, 27 to 32, 35 to 47, 50 to 53, 62 to 65, 68 to 70, 75 to 78, 80, 86, 89 to 91, 95, 101 to 103, 106, 117
- Loblolly-hardwoods—35, 38, 41 to 43, 47 to 53, 56 to 61, 63, 66 to 74, 77 to 84, 87, 88, 91 to 94, 96, 101, 114, 115, 117, 118, 129 to 133
- Naval stores—82 to 85, 87, 96 to 100, 101 to 114, 119 to 122, 124, 126 to 130
- Natural gas is available for consumption in the following counties—15, 19, 20, 27, 30, 36, 44, 45, 47, 49, 50, 66, 68 to 70, 77 to 79, 81

Agricultural products such as cotton, corn, peanuts, sweet potatoes, etc., which are used for industrial purposes, are grown in almost every county.

- Railroads
- Navigable Rivers
- Airlines
- Airports—also at principal cities printed in red.



# Georgia—

## Its Opportunities for Industry

**G**EOORGIA, popularly referred to as the "Peach" State and named for George II of England, was founded in 1733 when James Edward Oglethorpe and his settlers landed and established themselves on the site of the present city of Savannah. Peace was made at an early date with the Indians but it was not till 1742 that the threat of domination by Spain was dispelled with Oglethorpe's victory at the Battle of Bloody Marsh. Thus, with the establishment of the thirteenth colony, Oglethorpe is credited with having assisted materially in the ascendancy of English rather than Spanish rule in America. Georgia's statehood dates from the close of the Revolutionary War.

With an area of 59,265 square miles, 58,725 of which is land area, Georgia ranks twentieth in size and fourteenth in population which in 1939 was estimated at 3,122,931 with the colored race comprising approximately 37 percent.

### Climate

**G**EOORGIA has a variety of climate from the mountains to the sea, and is essentially temperate with an average of over 230 growing days throughout the year ranging from about 275 days in the south to 180 days in the north. The first frost usually arrives in early November and the last one is seldom later than the latter part of March.

The average temperature is 63.1° Fah. ranging from 46.3° Fah. in January to 79.1° Fah. in July. The normal annual precipitation averages 52.66 inches for the entire state. Usually, however, the months of October and November are the driest while the mountainous sections and particularly the Blue Ridge Mountains, have an average annual rainfall of 60 inches or higher which provides adequate surface and ground water supplies.

### Transportation

**I**N the matter of transportation, Georgia has over 6,500 miles of paved highway and 4,240 miles of state road are improved chert. In addition there are more than 100,000 miles of rural roads. Operating within the state are 52 bus routes and 78 motor truck lines. There is no state highway indebtedness.

The railroads, numbering 38, own over 7,000 miles of track and supply adequate passenger and freight transport from almost every section of the state. From Atlanta in the northwest central section of the state air transport reaches all parts of the nation, while various other cities are regular stopping places on regularly scheduled air routes.

Though the general coast line of Georgia is only 100 miles in length, two important seaports are located thereon. Savannah, with a channel exceeding 25 feet in depth and about 175 feet in width, has 55 slips or wharves and facilities for all oceanic traffic and is only 17 miles up the Savannah river beyond the bar. Brunswick, in the southern part of the state, is situated on the East river 16 miles from the Atlantic and has a channel ranging from 27 feet deep to the city and varying in width from 300 feet to 3,000 feet. Here are 22 piers and wharves. The value of exports and imports through these two ports in 1939 was \$23,178,586 and \$10,056,435 respectively, and as such were very much below the amounts of normal times.

Georgia also has a considerable number of waterways, some of which are already classified as commercially navigable and others are to be improved. A pulp and paper mill at Savannah in 1937 reported that 50 percent of their pulpwood was shipped to them by means of the inland waterways.

### Manufactures and Finance

**T**HE value of Georgia's manufactured products in 1937 was \$708,652,241, or \$193,997,226 more than the 1935 total of \$514,655,015. Of this amount, \$211,102,858 represented the value of cotton yarn, thread and woven goods, making Georgia the third largest producer in the Southern states. This continues the state tradition as the Bolton factory was the first successfully operated cotton mill in the South. Furthermore, Georgia was the first in the country to grow cotton commercially and it was at Savannah that Eli Whitney invented the first cotton gin. The number of active cotton spindles in 1939 was 3,085,632 which operated for a total of 12,416,396,000 spindle hours.

Among other leading industries of the State are those connected with cottonseed oil, cake and shortening from this product amounting to over \$27,268,138.

The number of wage earners employed in the state's 2,875 establishments is 159,496, with a payroll of \$110,501,344. Materials, containers, fuels, and purchased electric power cost \$439,145,132 in 1937.

With \$33,325,000 invested in capital stock, capital notes and debentures in the state's 284 banks in 1939, aggregate resources were \$519,707,000 and individual deposits, \$45,340,000. Savings deposits in all banks were \$112,224,000. Bank transactions for the six reporting exchanges totaled \$3,117,045,000 compared with \$2,838,848,000 in 1938.

### Agriculture

**G**EOORGIA is predominantly agricultural with over 40 percent of the state's gainfully employed population engaged in that pursuit.

From the 10,639,100 acres planted to crops in 1939, Georgia farmers received a cash income of \$118,648,000 which, together with \$35,285,000 from livestock and livestock products gave a total cash farm income of \$158,492,000. The largest single crop was cotton and more than 916,000 bales of lint were picked from 1,938,000 acres. The cash income derived from this source was \$39,896,000, while an additional \$6,804,000 was received from the resultant 407,000 tons of cottonseed. Tobacco is another important crop with 96,620,000 pounds yielding \$13,240,000 while 4,290,000 bushels of peaches brought \$6,032,000. Production of other major crops included 143,880,000 pounds of peanuts, 8,892,000 bushels of sweetpotatoes, 36,941,000 bushels of corn, and 8,946,000 bushels of oats.

The value of 3,057,000 head of livestock in Georgia in 1939 was \$87,926,000 including 1,009,000 cattle valued at \$23,634,000, 1,647,000 swine worth \$9,155,000, and 334,000 mules with a value of \$51,626,000. Dairy produce yielding \$18,321,000 included \$4,240,000 from eggs, \$2,374,000 from chickens and \$11,707,000 from milk.

Early realization of the importance of agriculture to the state is evident from the fact that the first state agricultural experiment station was established in Georgia in 1735.

Although the general coast line of Georgia is only 100 miles, the shore line consists of approximately 1,000 miles. In years gone by fishing was a thriving business, but of latter years circumstances have contrived to reduce the volume. Effort is being made now by private and official interests to rehabilitate the industry by eliminating polluted areas and encourage restocking of the productive waters. The total value of fisheries exceeds \$500,000 which represents a considerable increase over preceding years and includes a large quantity of menhaden for industrial use only. However, the value of edible fish industries exceed the value of the menhaden industry.

### Timber

**A**S a forest region, Georgia occupies an important position with approximately 21,430,000 acres of forest land or 56 percent of the total land area. Of this forest area, saw timber covers 11,367,200 acres—2,554,800 acres old growth and 8,812,400 acres second growth.

The saw timber stand amounting to 45,800,000,000 board feet, includes 33,400,000,000 board feet of softwoods (6,805,000,000 board feet old growth and 26,595,000,000 board feet second growth) and 12,400,000,000 board feet of hardwoods (6,025,000,000 board feet old growth and 6,375,000,000 board feet second growth).

The cordwood area of 3,755,000 acres contains 16,840,000 cords or 10,605,000 cords of softwood and 6,235,000 cords of hardwood, while the cordwood volume of the saw timber area amounting to 72,370,000 cords (31,120,000 cords of softwood and 41,250,000 cords of hardwood) bring the total state supply to 89,210,000 cords. In addition there are almost 2,000,000 cords located on restocking areas.

In 1938, 805,017,000 board feet of lumber was sawed, 704,473,000 board feet of softwood and 100,544,000 board feet of hardwoods while the value of lumber products in 1937, the latest year for which figures are available, was \$18,100,369.

(Continued on page 122)



## FOR BETTER BUSINESS

Georgia is located in the center of the Southeast—America's fastest growing market. Her wealth of natural resources, abundance of raw materials, excellent labor conditions, unusual transportation facilities, and delightful, temperate climate, combine to make this . . . the largest state east of the Mississippi . . . the natural habitat for progressive business.

After nearly a half-century of identification with industrial achievement in the Southeast, this institution . . . with five affiliated banks completely covering Georgia's most important trade areas . . . offers statewide facilities to business officials interested in the expansion of operations or the establishment of new enterprise.

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MACON—THE FIRST NATIONAL BANK AND TRUST COMPANY  
ROME—THE FIRST NATIONAL BANK  
SAVANNAH—THE LIBERTY NATIONAL BANK AND TRUST COMPANY

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If you are seeking a Southern location for a new plant, you will do well to learn about the advantages of Savannah.

There's Growing Room for certain types of industry in the Savannah Area—plus important factors of production and distribution not generally known.

Specific data applying to your own problem will be gladly furnished on request. Please address your inquiry in confidence to

### Industrial Committee of Savannah, Inc.

C. C. CURTIS, Chairman,  
Savannah, Georgia

## Georgia

(Continued from page 120)

Apart from saw timber, Georgia forests provide the bases of two major industries—pulpwood and naval stores.

In 1938, less than four million cords of wood were used for pulping in the entire South. This is about one-fifth as much wood as was used for fuel alone. On the other hand, as recently as 1936, the new timber growth in Georgia was 8.5 million cords (5.6 million cords of pine and 2.9 million cords of hardwood and cypress) compared with a consumption of only 5.3 million cords (3.9 million cords of pine and 1.4 million cords of hardwoods).

Perhaps the most important phase of Georgia forest industries at present, is the production of naval stores. For years Georgia has been the foremost producer of resins in the United States and in the 1939-40 naval stores season there were produced in 31 naval stores producing counties 227,469 barrels (50 gallons each) of gum turpentine amounting to almost 60 percent of the entire country's output. Savannah, which has been exporting these commodities to all parts of the globe from the earliest days is still the world's largest naval stores market.

## Mining and Minerals

THE mineral resources of Georgia, like many of the Southern states, have not yet been adequately explored. In spite of this fact, a wide variety of minerals have been produced for many years and while production decreased in value at the beginning of the present decade, this was due, not to the exhaustion of deposits but to general economic conditions, and the trend of industrial evolution. More recently the value of Georgia mineral production has increased until in 1937 it reached \$14,268,281. The change was brought about by the large variety of minerals which Georgia could supply. As the demand changes so does Georgia appear to have that which is required. Evidence of this is in the fact that no less than 35 different rocks and minerals have been mined commercially at some period of the state's history.

On the accompanying map are indicated those minerals which now are being commercially produced. Other deposits of these varieties are known to exist in several other counties and will possibly yield to commercial production after further examination as to quality and quantity.

Georgia produces over half of the white clay (kaolin) used in this country. About 60 per cent of this is used as a filler and coating clay for white paper, the remainder going into the manufacture of pottery, fire brick, and other products.

Georgia ranks second in the production of monumental and building granite. Three main varieties are produced: the blue, dark gray, and pink monumental granites of the Elberton district; the light gray uniform Stone Mountain granite; and the gneissic granite of the Lithonia district. Considerable crushed granite is produced in these and other districts.

Georgia marble, which is internationally known, is available in several counties and the total supply is stated to be inexhaustible. White, mottled gray and flesh-colored varieties of true marble, as well as serpentine or Verde Antique (green marble), are now produced and other colors are available.

Portland cement is produced at two plants and ample deposits provide for future expansion of the industry.

Georgia is the largest producer of fullers earth in the United States. The deposits in southwest Georgia are used for bleaching petroleum oils, whereas those of middle Georgia are best suited for clarifying vegetable oils.

Limestone is abundant in northwest Georgia and in the Coastal Plain section of the state. The north Georgia limestone is quarried at several places and at one place is manufactured into lime. The soft unconsolidated deposits of limestone of the Coastal Plain are used as a road-building material.

The Cartersville district of north Georgia has long been famous for its adjacent deposits of barite, manganese, ocher, and brown iron ore. Georgia ranks second in the production of barite and third in the production of manganese ore.

Gold has been mined in Georgia for over a century. Before the discovery of gold in California, the mines of Georgia furnished a large part of the gold production of the United States, and from 1838 until 1861 a United States Mint was located at Dahlonega. The total recorded production of gold in Georgia to date has been approximately \$18,000,000. The present high price of gold has stimulated interest in Georgia's gold mines and the recent discovery of a new rich vein near Dahlonega promises to increase production further.

Bauxite, coal, flagstone, graphite, kyanite, mica, slate, and talc are all produced in minor amounts in Georgia, and the following minerals have been mined in the past or are present in possible commercial quantities: asbestos, bentonite, chromite, copper, corundum, feldspar, olivine, pyrite, tripoli, and vermiculite.

## Electric Power

GEORGIA is generously supplied with electric power generating facilities and is capable of supplying all normal demands that are likely to materialize.

In 1939, production of electricity by public and private plants in the state totaled 1,612,092,000 kilowatt hours, which represents an increase of almost ten percent beyond the 1,491,750,000 kilowatt hours produced in 1938. Of the 1939 amount, 414,698,000 kilowatt hours were from plants operated by fuels, or approximately 25 percent of the total. The remaining 1,197,394,000 kilowatt hours came from hydroelectric plants.

The total capacity of generators in power plants in the state is 481,139 kilowatts. Water power facilities in 28 plants have a capacity of 337,592 kilowatts and steam power generators in 26 plants have an additional capacity of 141,513 kilowatts. Six internal combustion engine plants have the remaining capacity of 2,034 kilowatts.

The principal hydroelectric generating facilities and their capacity are as follows:

21 Georgia Power Company plants . . .	498,202	Horsepower
1 Tennessee Electric Power Co. plant . .	30,000	"
1 South Carolina Power Company plant . .	25,000	"
1 Crisp County, Ga. plant . . . . .	9,600	"

## Taxation

ALTHOUGH there is no state tax exemption for new industries in Georgia, individual counties numbering one hundred or more and about 140 cities have voted to exempt new industries and additions to old ones from taxation.

The ad valorem tax, not to exceed five mills and assessed at approximately 25 percent to 35 percent of actual valuation, is composed of two divisions. The first is physical property which includes real estate, buildings, machinery, raw materials, finished products, etc., and the second, comprising, personal property, includes cash, notes and accounts receivable, and stocks and bonds.

The tax on corporations incorporated under the laws of Georgia, except those that are not organized for gain or profit and domesticated foreign corporations, ranges from \$10 for corporations with issued capital stock not exceeding \$10,000, to \$5,000 for corporations whose capital stock is over \$22,000,000.

City and county taxes average throughout the state, 35 mills on the assessed valuation. In Atlanta the assessed valuation on property is about 70 percent of fair valuation.

The state law applying to corporation income tax states that "Every domestic corporation and every foreign corporation shall pay annually an income tax equivalent to five and one-half percent of the net income from property owned or from business done in Georgia, provided, that the amount of the tax shall not be less than would be produced by applying a rate of two percent to a base consisting of the entire net income, plus all salaries and other compensation to all elected and appointed officers, and to the stockholders owning in excess of five percent of the issued capital stock of the corporation or a relative per centum of the capital stock of any other corporation owning or holding the capital stock of such corporation, and after deducting from such base \$10,000 and the deficit, if any; such tax shall be assessed upon the base provided by this section which will produce the greater tax."

The total assessed value of taxable property in 1939 was \$900,695,698.

## Labor and Wages

THE population of Georgia, which consists of 99.2 percent native born people, is essentially decentralized with the urban population comprising about 30 percent. In 1930 there were four cities with populations exceeding 50,000, but preliminary figures of the 1940 census already show five cities now greater than 50,000 population. They are: Atlanta, 302,538; Savannah, 95,271; Augusta, 65,945; Macon, 57,793; and Columbus, 53,104.

Labor, of which there is a plentiful supply, is willing and intelligent and available for skilled and unskilled work in virtually every part of the state.

The prevailing wage rate varies with the industry and location. However, with certain exceptions, the following are averages per hour based upon density of county population. Over 100,000: unskilled labor, 30 cents; semi-skilled, 42½ cents; and skilled, 80 cents. Counties with population between 25,000 and 100,000: unskilled, 25 cents; semi-skilled, 37½ cents; and skilled, 70 cents. Counties with population between 5,000 and 25,000: unskilled, 25 cents; semi-skilled, 30 cents; and skilled 60 cents. Counties with populations of less than 5,000 each are approximately 5 cents less in each category.

The wage rate exceptions noted above are confined to skilled labor in a variety of trades in about 25 counties. In these instances the rates vary from 60 cents to \$1.25 per hour and altogether average 85 cents hourly.



## Get the Whole Georgia Picture

*The book,  
of course,  
is free*

Georgia's attractions for industry go far beyond a simple catalogue of raw materials, splendid transportation, beneficent climate, intelligent labor, abundant low-cost power and the other *usual* requirements. Learn the *unusual* story of Georgia. Get the whole picture! Our new 48-page, profusely illustrated book, "Georgia on the March," will take you on a revealing tour of the state. We will be glad to mail you a copy, on request.

*Industrial Department*

**GEORGIA POWER COMPANY**

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WELL-MADE WELL-KNOWN WELL-LIKED

### DIXISTEEL PRODUCTS

SERVE SOUTHERN  
AGRICULTURE, INDUSTRY,  
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ATLANTIC STEEL COMPANY  
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*Oldest Trust Company in Georgia—Organized July 1, 1869*

## SAVANNAH BANK & TRUST COMPANY

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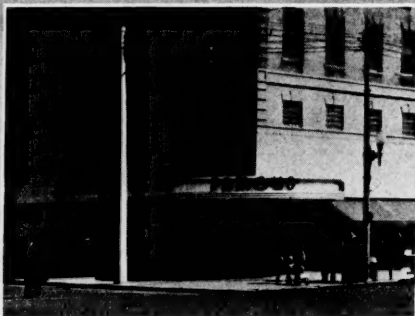
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Blumberg's Department Store, Portsmouth, Va. Bernard B. Spigel, architect; R. F. Trant, Inc., air conditioning contractor; Norfolk, Va.



Rice's Store, Norfolk, Va. Bernard B. Spigel, architect; R. F. Trant, Inc., air conditioning contractor; Norfolk, Va.; P. L. Davidson, consulting engineer, Philadelphia.



Alfred I. duPont Bldg., Miami, Fla. Marsh & Saxelby, architects, Jacksonville, Fla. Pennsylvania Engineering Company, air conditioning contractors, Philadelphia.

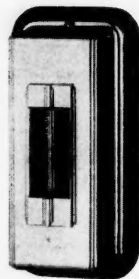


## AMERICAN DEFENSE against sluggish business — MODERN AIR CONDITIONING WITH CONTROL BY JOHNSON

The American way of guarding against sluggish business is to provide customers with more diversified services, additional conveniences, and greater comforts. Countless stores, restaurants, hotels, office buildings, and other places of business, which live by serving the public, are aware of the business-getting value of modern air conditioning. And "Control by Johnson" is applied to all types of such systems.

In the buildings pictured above, Johnson automatic temperature and humidity control

systems are the "brain" of the air conditioning plants. In the three stores, where direct expansion coils are used for cooling, Johnson's distinctive Modulating Control of the refrigerant is employed. In the duPont Building, there is a "reverse cycle" system, chilled water being used for cooling and hot water for heating. In all four installations, Johnson controlling instruments impart true g-r-a-d-u-a-l control to the various valves and dampers. Ask for bulletins describing this and other apparatus.



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*Automatic* TEMPERATURE AND AIR CONDITIONING *Control*

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# KENTUCKY



*The credit of being the largest industrial organization in Kentucky is the Ashland Division of The American Rolling Mill Company where there are more than 3,000 employees with a payroll in 1939 in excess of \$5,500,000. The most outstanding development in the history of the Ashland Plant was the installation of the steel industry's first continuous rolling mill in 1923. This inaugurated the now common practice of rolling steel from ingots into a long ribbon of coiled metal. John B. Tytus, who invented and supervised the first mill, was awarded the "Modern Pioneers" plaque for what is considered one of the most revolutionary developments in the entire history of steel making.*

## KENTUCKY—GATEWAY TO THE SOUTH'S RESOURCES

**K**ENTUCKY is a state having abundant and diversified resources, and strategically located for commercial and industrial purposes. Eastern mountain and forest lands, Blue Grass limestone soils, western agricultural and mineral resources provide a basis for economic balance in mining, manufacturing, agriculture, and trade. The legislature established in 1936 a streamlined state government—taxes are relatively low, and a general harmony exists between government and business.

### Manufacturing, Trade and Construction

According to the Census of Manufactures,  
SOUTH'S RESOURCES ISSUE

BY  
James W. Martin, *Director*  
and  
W. G. Herzel, *Assistant*  
Bureau of Business Research  
University of Kentucky

Kentucky, in 1904, led the southern states in value added by manufacture. The value added showed a 53 per cent increase over 1899. However, during the following twenty-five-year period, 1904 to 1929, the percentage in-

crease of manufacturing was among the lowest in the South. The war-time span, 1914-1919, was marked by an absolute decline of about 4 per cent while the remaining states in the South enjoyed nearly a 32 per cent increase. This drop may be traced chiefly to the fact that distilleries, whose business amounted to more than a third of the manufacturing value in 1914, were abruptly closed by proclamation and the prohibition amendment of 1918 and that there was rapid shrinkage of the lumber market and exhaustion of profitable timber stands which brought a 27 percent decline in that industry. Some recovery was experienced between 1919 and



1929, manufactures increasing more rapidly than in any other southern state. Adjustment had taken place in the dislocated whiskey and lumber industries, and shifts to new lines of activity had occurred.

Geographic analysis of Kentucky industry indicates that over 85 per cent of the value added by manufacture is created in counties facing the Ohio and Mississippi rivers, with six of these counties contributing more than 81 per cent of the total. Jefferson County alone accounted in 1929 for 55 per cent. The six most important cities in these counties produced 70 per cent of the total volume of manufactures and employed over 60 per cent of the wage earners. Ninety-two inland counties contributed less than 14 per cent of the manufacturing output. Throughout the entire twenty-five year period immediately preceding there was an increasing tendency for industry to locate in river counties as evidenced by the fact that they provided an ever larger share of the total manufacturing output. This fact is to be explained in part apparently by the differential freight rates between the interior counties and the central and eastern states north of the Ohio River. Moreover, some southern states were able to secure more favorable rates for certain commodities, thus giving them also a competitive advantage over interior Kentucky.

Kentucky manufacturers' depression experience, 1929-1935, was more satisfactory than that of their colleagues in many other states. However, due to the upheavals of the early 1930's and to price readjustments, the recent tendencies in the state can best be observed in the light of what has happened since 1935.

From 1925 to 1937 the value of manufactured products increased from less than \$451,000,000 to nearly \$505,000,000, with the number of wage earners increasing from 60,800 to 69,000. The alcoholic beverage industry constitutes the most important manufacturing business in the state. Flour, grain, and bakery products combined were next in value. Meat packing has expanded recently, the 1937 exceeding the 1935 value of products by 65 per cent. Lumber, cooperage, furniture and office furniture, paints and varnishes, clothing, dairy products, and electrical machinery are other manufactures of importance.

Electric power facilities are essential to industry, and Kentucky power resources, present and potential, seem ample. Production in 1938 totaled about the same as 1937 and more than 33 per cent above 1933. Rates have recently been greatly reduced. A potential source of power for western Kentucky is the hydroelectric development project now under construction by the T.V.A. on the lower Tennessee River.

Rural electric service advanced rapidly after 1937 when the state enacted a law permitting the establishment of rural electric cooperatives to receive financial assistance from the federal government. By the end of 1939 the federal government had allotted nearly \$9,000,000 to 23 cooperative associations operating 7,500 miles of line that served 19,300 rural homes and farms. Between 1936 and 1939 private utilities extended their service to an

additional 16,500 homes requiring 2,300 miles of new line. Rural electrification in the future will be significant for both industry and agriculture.

### Trade—Wholesale and Retail

Wholesale business showed increases from 1935 to 1937 in the major lines of activity: dry goods 13 per cent, plumbing 51 per cent, hardware 36 per cent; and electrical goods 268 per cent. However, retail trade reacted sharply to the 1938 recession showing a decline in most lines for the first half of 1938 as compared with 1937. Local merchants reported 1939-40 winter sales the heaviest in years, indicating that consumer incomes in Kentucky had increased with improved business conditions.

Construction activity exhibited its expected sensitivity to the cyclical pattern throughout the last decade.

Index of Construction Value, Kentucky and U. S. Compared  
1933 = 100

Year	Kentucky Total Value	Index	U. S. Total Value	Index
1933	\$27,848,000	100	\$1,255,000,000	100
1935	28,105,000	100.9	1,846,000,000	147.1
1937	43,933,000	157.8	2,863,000,000	228.1
1939	167,166,000	600.3*	3,550,000,000	282.9

\*If the 1939 figure is adjusted to exclude the T.V.A. Gilbertsville project the index for that year would be reduced to 179.

### Agriculture and Forestry

According to the Kentucky College of Agriculture, progress in agriculture should be viewed from the standpoint of policies which will tend to insure a satisfactory life for farm folk and to conserve the state's resources. Among evidences of progress has been the recent attention given to agricultural planning, with emphasis on land use, planning, crop diversification, and increased use of fertilizers. Soil erosion control by increased contour cultivation, wider use of cover crops, and grazing rather than crop production, has been a major point of progress.

There has been recent improvement in breeding crops and livestock, especially in developing disease-resistant strains. Tobacco is the state's most important crop, Kentucky ranking second to North Carolina. The 1939 yield was valued at approximately \$55,000,000 and approximated the ten-year average of 320,000,000 pounds. Second only to tobacco in Kentucky agriculture is livestock. There is a need for more grass for feed and for soil conservation. Larger hay crops will permit more sheep, more cattle, more dairying. Cattle breeding has shown marked improvement; it is estimated that 65 per cent of the bulls are pure-bred. The United States Department of Agriculture credits Kentucky with being the leading state in recent livestock improvement. The Experiment Station recently perfected new high-yielding hybrid corns which appear to produce locally 10 to 20 per cent more than common varieties.

Kentucky's generally mild winters and nearness to Eastern and Northern markets give the state a sheep marketing advantage. It is estimated that about 200,000 cross-bred ewes were imported from the West in 1939. Much

of the improvement in Kentucky herds has been due to the breeding of such ewes with native pure-bred rams.

Kentucky ranks second among the states in the growing of sweet potatoes, produced mainly in the extreme western portion of the state. Approximately 1,200 cars of Irish potatoes are shipped annually to other states. The state is fourth in strawberry production. Apples account for the largest item of income from Kentucky fruits. Truck gardening is encouraged in the northern part of the state by easy access to population centers.

Kentucky has about 10,000,000 acres in timber, but saw-timber acreage is less than 3,000,000. The principal varieties of wood used for commercial purposes are chestnut, oak, poplar, gum, hickory, and beech. Extensive mining operations in both ends of the state restrict forestation programs while the

Blue Grass section is too valuable for farm purposes to be devoted to forests. However, recently there has been an increase in lumber production.

Tendencies in the State Lumber Industry		
Number of lumber establishments ..	1935 146	1937 147
Value of Products ..	\$5,594,000	\$8,788,000
Cost of materials ...	2,200,000	3,800,000
Wages .....	1,500,000	2,250,000
Average value per 1000 feet .....	\$29.52	\$22.20
U. S. Average value per 1,000 feet ...	32.78	24.25

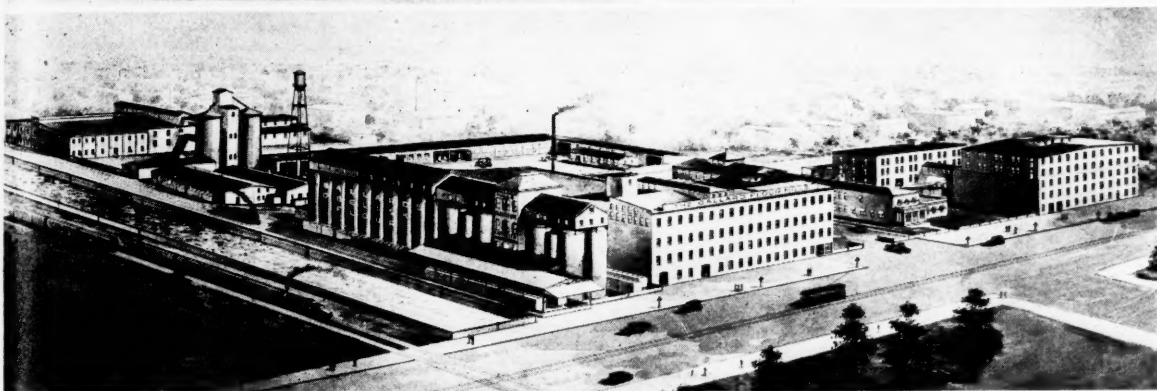
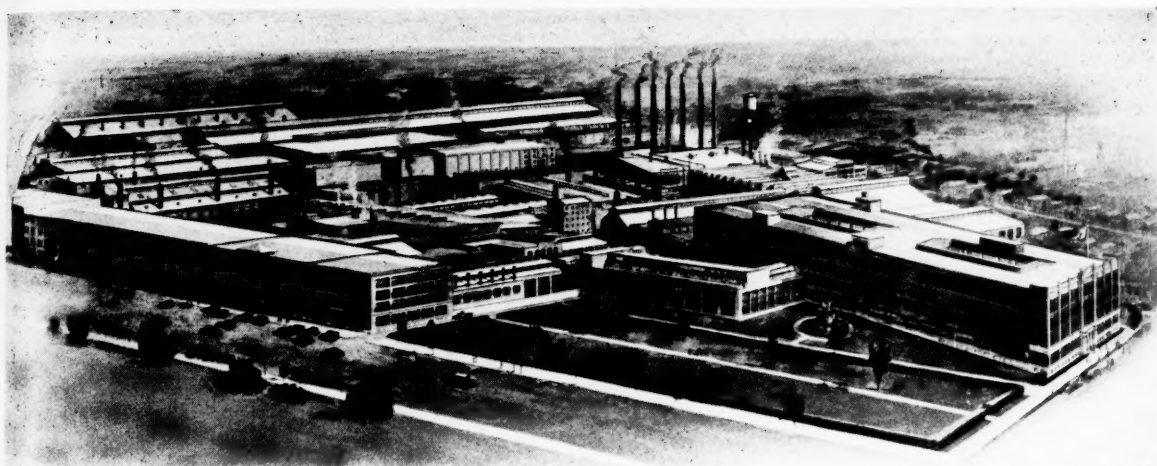
Estimated receipts from sales of principal farm products and from government agricultural payments amounted to approximately \$146,700,000 in 1939.

### Minerals

Kentucky produces bituminous coal, fire clay, rock asphalt, and fluor spar. In 1937 mineral production was valued at almost \$127,500,000; while in 1933, the trough of the depression, mineral production totaled but \$65,000,000. Mining accounts for the largest aggregate payroll in the state, 53,000 workers being employed in mines and quarries.

The state's chief mineral resource is bituminous coal, and in 1938 Kentucky ranked as fourth state and produced slightly more than 11 per cent of the total U. S. output. Coal is mined commercially in 40 of the 120 counties.

Petroleum is commercially produced in 37 counties, and gas in 29, Kentucky ranking twelfth in the former in 1938. A new oil field, recently developed, accounted for a 25 per cent increase in production from 1933 to 1938. In 1938 Kentucky gas production ranked eighth, amounting to about 50 per



*The extent of Kentucky's diversified manufacturing is evident from the fact that the census reports list 65 different types of industry—45 of them having products valued annually in excess of one million dollars. Three of Kentucky's largest plants representative of important industries are: top—The Louisville plant of the American Radiator and Standard Sanitary Corporation; center—The Ballard and Ballard Company plant at Louisville is the world's largest soft winter wheat mill; bottom—The Seagram-Distillers Corporation distillery at Louisville, the largest in the state.*

cent more than in 1935.

Clays of several varieties are found in abundance throughout Kentucky, which ranks fourth in production; however, only fire clay and ball clay have large commercial significance. Limestone for building purposes, highways, and railroads is available in 38 counties. One company has developed a business manufacturing crushed stone for fertilizer and rock wool for the building trade. Phosphate rock exists in large quantities in the Blue Grass, but commercial production is precluded by the high value of agricultural land. Kentucky is a heavy producer of rock asphalt. Another valuable mineral found in considerable quantity is fluorspar, production of which in 1938 was below the ten-year average, though the State in 1937 still ranked first.

### Railroad Prosperity

Short-run developments in transportation indicate something more than the situation obtaining in that industry itself. It is important, of course, to consider the prosperity of so essential an economic function as transport; it becomes doubly significant in view of the extent to which data regarding such activity reflect general movements of business. Unfortunately the data for a state-by-state comparison are reasonably available only for railroads, and the figures can be but a partial reflection of what has occurred. Particularly in the period of rapidly developing highway transport from 1935 to 1939 inclusive, the railroad statistics reflect for 1939 a lower proportion of total business than is represented in 1935 figures.

In the accompanying chart, data for the state and data for principal carriers in the eastern and western areas of Kentucky are shown separately and are compared with income payments as estimated by the United States Department of Commerce. The railroad net earnings data are derived from net railway operating income apportioned to Kentucky, in the case of interstate carriers, on the basis of the percentage in Kentucky of: (a) the miles of all track, (b) the estimated cost of reproduction as of valuation date plus additions minus retirements, (c) the car and locomotive miles traveled, (d) the revenue from railroad operations, and (e) the number of passenger miles plus the number of freight ton-miles of traffic. This is a standard allocation method and has received wider approval than any other. The chart must be read in the light of the fact that railroad earnings in Kentucky were comparatively satisfactory even in the depression period of the early 1930's.

(The annual average for Kentucky earnings for these seven principal railways, 1935-1939, is \$19,674,000; and their lines in the state aggregated about 2,500 miles—under 4,000 miles of all-track).

It will be observed that there is some conformity between railroad earnings and income payments except that owing largely, it appears, to the earlier impact of the 1937 business recession on the coal industry and to the average cut of about eight cents a ton in the average coal freight rate—there was a marked decline in Kentucky rail prosperity in 1937 as compared with the previous year, rather than a slight increase as shown by income payments. It is of interest that the railroads of western Kentucky did not experience this cut and that their earnings have consequently paralleled more closely the general index of economic well-being.

### Government, Taxation and Financial Management

One of the most significant changes in Kentucky's state government took place in 1936 when the Reorganization Act was passed, making possible efficient management and responsible control. The state government now operates under budgetary management facilitated by modern accounting and reporting installations. Tax collection and other phases of financial administration are business-like.

For a number of years there has been legal provision for the state to assist local units in property tax administration, but only recently has an active program been developed for better assessment and collection of local taxes. The Department of Revenue, pursuant to a plan partially initiated in 1934, assumed in 1936 the responsibility for county financial service including approval of budgets. The Department is also in process of installing uniform county accounting. The county aid act of 1938 provided for state assistance in debt administration.

Since 1936 the state tax system has been revised to secure revenue with more justice and convenience to taxpayers. Changes have included repeal of the 3-per-cent sales tax, repeal of most occupational license taxes, enactment of relatively low-rate personal and corporation income taxes (corporation rate, 4 per cent), revision of inheritance tax law imposing higher rates on moderate-sized legacies, enactment of a substitute chain-store tax based on the total number of units in the chain and imposing lower maximum taxes, and reduction of most motor vehicle licenses to a flat rate of \$4.50.

Kentucky enjoys a high credit rating and is able to finance at minimum interest rates. At the end of 1935 the state as such owed over \$28,000,000, three-fourths of which had been paid by 1939. Compared with other states, the combined state and local per capita debt was less than that of any other state except Georgia in 1937, the Kentucky per capita debt totaling \$30.66 as compared with Georgia, \$26.62.

### Population, Employment and Labor Conditions

Population facts and trends reveal that Kentucky has one of the highest net fertility rates in the country and hence a large percentage of persons in the lower age groups—in other words a definitely young population. Thus, heavy emigration has been the chief factor limiting population growth.

The 1930 census showed 2,615,000 people, and the state Department of Health estimates approximately 3,000,000 at the close of the decade. The proportion of farm population dropped from 54 per cent in 1920 to 45 per cent in 1930, and the 1940 census will doubtless show a still higher ratio of urban to total population. Over 91 per cent of the population in 1930 was white, and 99 per cent American-born.

The relatively large percentage of young people in the state insures a more than adequate labor supply. The labor efficiency is being improved by the recent establishment of vocational schools and increase in minimum educational standards in rural areas. An average of 288,639 persons was regularly employed in activities covered by the state unemployment compensation act between October, 1937 and September, 1938. Distribution among the principal activities is as follows:

Trade	12.0%
Manufacturing	29.3%
Mining	14.3%
Transportation and utilities	14.4%

The employment index, using April, 1938 as a base month, ranged from a high of 124 in March, 1937, downward to approximately 100 throughout 1938. Payroll indexes followed this downward trend. Maximum W. P. A. hourly rates effective September, 1939 were 28 to 40 cents per hour for unskilled and 50 to 73 cents for skilled labor depending on size of locality and other factors. Union organization is extensive only in the large urban areas and the coal fields.

### Kentucky Invites Economic Development

Kentucky's outstanding business develop-

INDEXES OF KENTUCKY RAILROAD NET EARNINGS AND OF KENTUCKY INCOME PAYMENTS\*

Table Used	Eastern Railroads		Western Railroads		Aggregate		Income Payments	
	Earnings	Index	Earnings	Index	Earnings	Index	Income	Index
1935	\$17,033,595	92	\$667,115	44	\$17,700,710	90	\$717,000,000	87
1936	23,313,390	126	1,691,634	111	25,005,024	127	846,000,000	102
1937	18,729,361	101	1,757,183	116	20,486,545	104	893,000,000	108
1938	13,713,697	74	1,688,334	111	15,402,031	78	830,000,000	100
1939	17,980,418	97	1,795,685	118	19,776,602	101	849,000,000	103

\*Income payments statistics have been provided by the U. S. Department of Commerce, except that 1939 figures have been estimated by the Bureau. Data for earnings provided directly by C. & O., L. & N., I. C., C. N. O. & T. P., SO., M. & O., & N. C. & St. L. railroads (L. & N. treated as Eastern Ky. road) and apportioned to Kentucky on the basis of gross receipts, traffic units, car and engine miles, miles of all track, and cost of reproduction new less depreciation plus net additions since valuation date at cost.



ment since 1933 has been reestablishment of the liquor industry following repeal of the Eighteenth Amendment. After occupying first place among the state's manufactures in pre-war days, then forced by non-economic factors to inactivity for over 15 years, the makers of bourbon whiskey have, within the past five years, restored the industry so rapidly that it again constitutes the most important manufacturing business in the state, and in output ranks first in the nation. A significant feature of the recent development has been the increasing concentration and formation of large "chain" units through merger and consolidation, with consequent elimination of numerous independent operating firms. A second

notable fact is that by 1939 production and storage constituted over eight times the withdrawals for consumption. This indicates, apparently, that the peak has been reached and that the industry will not expand farther until change in the market justifies such action.

Although whiskey occupies a dominant position, other beverages and processed food products have shown promising growth within the past decade, and conditions appear to invite still further development. In addition to the restoration of the brewing industry during the past five years, there has been a rapid expansion in the soft drinks field. Meat packing has advanced considerably due to the tendency toward decentralization. Processing

of dairy products, including butter, cheese, and condensed milk, has been gaining in importance. Bread and other bakery goods together with flour and other grain products furnish another type of growing business and seem to offer the industrialist good opportunities.

A number of textile and clothing firms have been established in the last few years and others may be expected to continue the movement so long as labor and other costs are more favorable than elsewhere. Men's clothing especially, including regular ready-to-wear and work clothes, are among the possibilities not yet apparently as fully exploited as may be expected in the future.

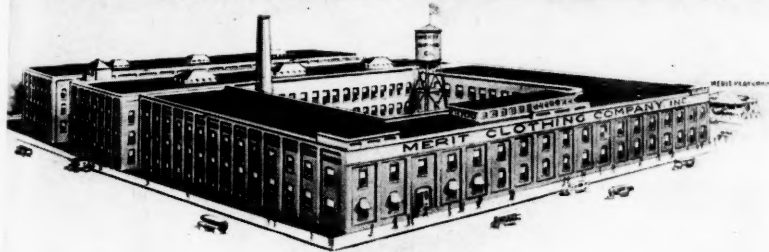
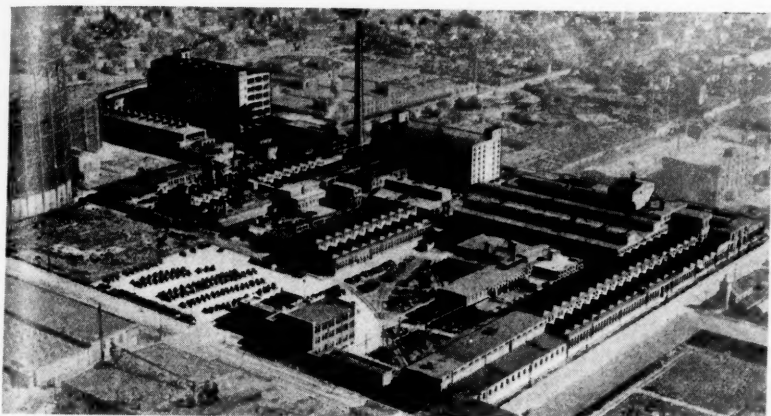
Furniture manufacturing is well established, and new developments are occurring. Louisville has long been a hardwood center; and though in certain respects market structures have been unsatisfactory in recent years, expansion of production has occurred along some lines. Other Kentucky centers are producing in lesser quantities. Metal furniture is not yet an important Kentucky industry, but the possibilities appear inviting. A related industry, cooperage, has shown remarkable growth. It is anticipated, however, in the light of conditions in the whiskey industry, that further development will not be rapid. In such closely kindred lines as paper, paper pulp, and rayon, and miscellaneous plastic products little advantage is being taken of the promising opportunities offered.

Among the most inviting possibilities of expansion in Kentucky manufacturing are several lines dependent on the use of clays. Among these are fire and other brick, tile, porcelain, and electrical insulation specialties. Tennessee Valley Authority studies are said to have revealed inviting possibilities which at present are little exploited.

Among the capital goods manufacturing lines, those which seem to promise most for the immediate future include several which have shown recent rapid growth. One is leather goods manufacturing, which has recently grown amazingly. Paint and varnish manufacturing has shown wholesome recent growth. The refining of petroleum also has considerably increased, and the prosperity of local industry augurs well for the future of this substantial industry.

The national military preparedness program may result in considerable local industrial expansion. Several types of manufacturing already important provide one basis. The favorable location of the state in the middle of the United States and in relation to Fort Knox and other pivots of military strategy suggest that the industry of the Blue Grass and nearby states may become of key importance. Already important construction in the Louisville area has been initiated.

*Three of Kentucky's largest industries are here represented by: top—The Henry Vogt Machine Company of Louisville, manufacturers of drop forged steel valves and fittings, water tube boilers, oil refinery and ice making machinery, etc.; center—The Merit Clothing Company of Playfield, manufacturers of men's clothing; bottom—The Axton-Fisher Tobacco Company of Louisville, manufacturers of cigarettes from Kentucky's large and important tobacco crop.*





# KENTUCKY

Its principal raw materials and transportation facilities, with facts on the reverse side pertaining to its industrial growth and opportunities for industry.

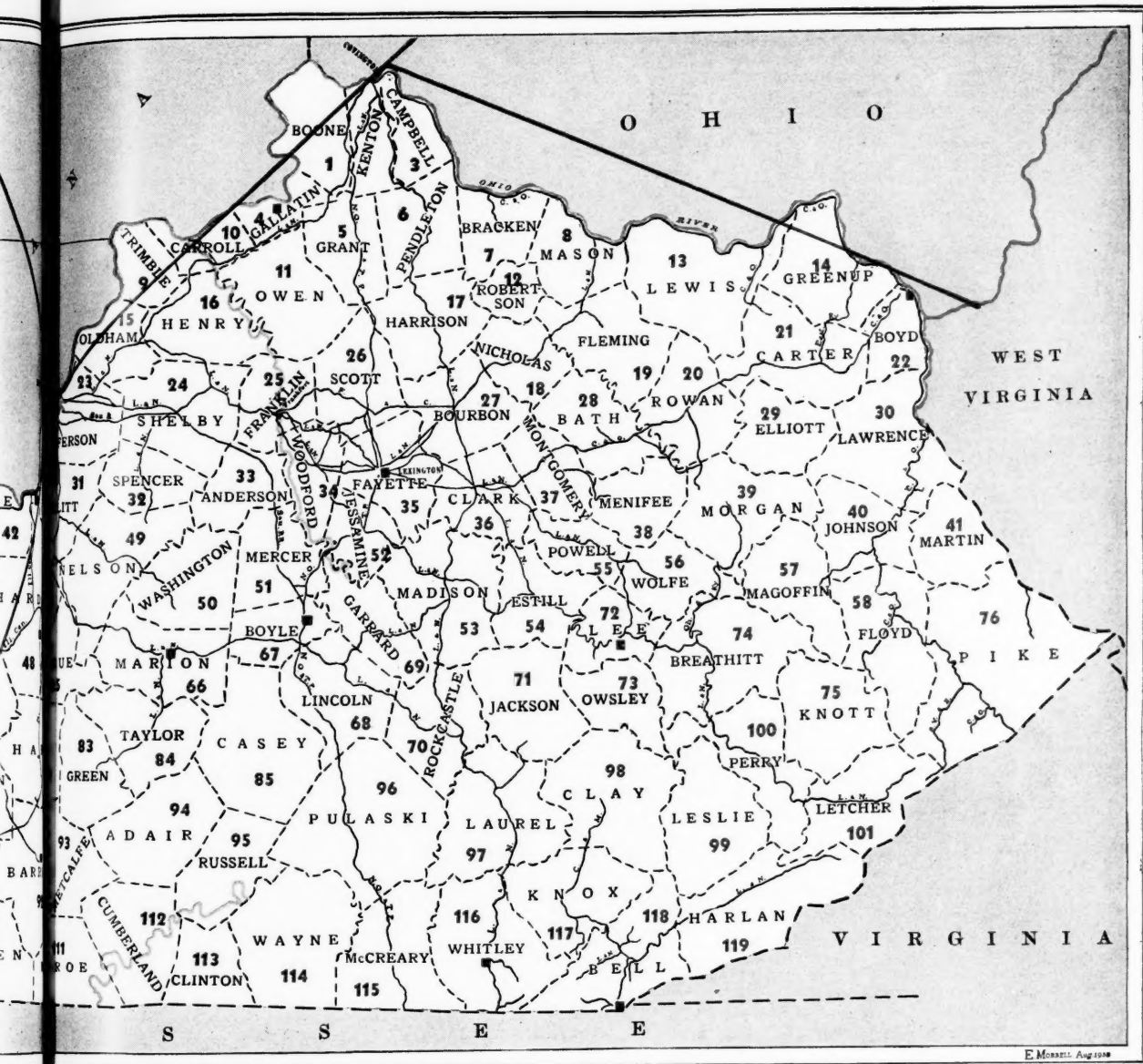
**Mineral** — Counties in which mineral is commercially produced.

**Asphalt rock**—48, 64, 81, 108  
**Clay**—21, 53, 55, 61, 103, 106  
**Coal**—14, 21-22, 30, 38-41, 43-45, 56-58, 60-63, 70-72, 74-76, 79-80, 96-101, 106, 113-119  
**Coke**—22  
**Fluorspar**—34, 59, 77, 78, 90, 105

**Glass sand**—21, 48  
**Lead**—59  
**Limestone**—2, 3, 17, 19-21, 25, 27, 31, 33, 36-39, 42, 47, 49, 51, 53, 55, 63-64, 66-67, 70, 72, 76, 91-92, 94, 96, 101, 104, 106, 108, 113-114, 118  
**Natural gas**—20-22, 38-42, 44-48, 55, 57-58, 60-63, 71, 73, 75-76, 93, 98, 101, 106, 117  
**Petroleum**—22, 28-30, 38-41, 44-48, 54-58, 61-63, 72-73, 75, 79-80, 82, 91-93, 109-110, 112-116  
**Sand and gravel**—3, 10, 14, 21-23, 25, 44-46, 48, 76, 101  
**Sandstone**—21, 38, 57  
**Zinc**—59  
**Corn**—all counties  
**Cotton**—102, 120  
**Pecans**—44, 45, 102, 103  
**Soybeans**—1, 21, 24, 39, 40, 42, 43, 45, 60, 62, 63, 68, 74, 80, 88, 91, 102, 103, 106, 114, 116  
**Sweetpotatoes**—1 to 3, 13, 14, 18 to 23, 29, 30, 34, 35, 37 to 45, 47, 48, 51, 53 to 68, 70 to 120  
**Tobacco**—1 to 74, 76 to 117

**Timber**

**Black**  
**White**  
**Hickory**  
**Beech**  
**Poplar**  
**Maple**  
**Sycamore**  
**Cum**  
**Basswood**  
**Elm**  
**Post Oak**  
**Walnut**



E. Merrill Aug 1948

#### Timber

**Black Oak**—all counties  
**White Oak**—all counties  
**Hickory**—all counties  
**Beech**—1-35, 37-42, 45-87, 89-101, 103-120  
**Poplar**—1-5, 8-16, 18-26, 28, 30-34, 37-47, 49-52, 54-120  
**Maple**—1-28, 30-40, 42-81, 83-103, 105-110, 112-120  
**Sycamore**—2-5, 7-13, 15-20, 23-27, 31-39, 42-51, 53-57, 59-65, 67-70, 77-81, 83-96, 99-100, 102-114, 120  
**Gum**—19-20, 33-34, 37-39, 42-49, 51-52, 54-64, 66-74, 76-79, 81-100, 102-109, 111-120  
**Basswood**—1, 4-5, 10-13, 15, 18, 20-21, 23, 25-26, 28, 31, 33, 36-39, 45, 47, 51-55, 57-58, 62, 70-77, 94, 96-101, 106, 108, 117-119  
**Elm**—1-7, 9-12, 15-19, 23-28, 31-37, 42-48, 50-52, 59-66, 69, 77-81, 84, 86-91, 93-95, 102-113, 120  
**Post Oak**—15, 23, 31, 42, 46-50, 59-66, 77-82, 84-95, 102-113  
**Walnut**—1-7, 9-12, 16-19, 24-28, 32-33, 35-37, 50-53, 66-71, 74-77, 80-81, 92-94, 97-101, 106-110, 118-120

**Ash**—1-4, 6-13, 15-21, 23-28, 31-39, 42-45, 47-53, 55-56, 58-64, 66-71, 73-81, 86-89, 93, 95, 97-101, 103-104, 106-120  
**Cedar**—9, 11, 25, 31, 33-34, 36, 42, 48, 51-53, 64, 69-70, 81, 91-92, 95-96, 108, 112-114

**Natural Gas** is available for consumption in the following counties—1-3, 7-8, 14, 17, 22-23, 25-27, 30, 34-37, 39-41, 44-48, 53-54, 57-58, 60-61, 76, 78-79, 81-84, 91-92, 97-98, 100, 106, 108-110, 116-117

— Railroads  
 — Navigable Rivers  
 — Airlines  
 ■ Airports—also at principal cities printed in red



# Kentucky—

## Rich in Material Assets

**K**ENTUCKY, frequently referred to as the "Blue Grass" state, entered the Union in 1792. It is contended by some that La Salle was the first to discover Kentucky in 1669 when he passed down the Ohio River, while others state it was Marquette and Joliet in 1673 to whom the honor belongs. Regardless of whom the discoverer actually was, the first permanent settlement was not made till 1774, at Harrodsburg, though previous sporadic attempts had been attempted in earlier years. In 1775 colonization started in earnest with purchase of land from the Indians and after eventual ratification of the latter by Virginia (Kentucky at that time was considered part of Fincastle County, Virginia), immigration became strong in 1780. From that time on, the movement spread for Kentucky to separate from Virginia and become a sovereign state. Virginia strongly opposed the suggestion and it was not till 1789 that remedial legislation was finally enacted to permit Kentucky to enter the Union in 1792.

Ranking 36 in size with a total area of 40,598 square miles of which 417 square miles are water area, Kentucky ranks 15th in population which amounted to an estimated 2,903,000 in 1937. The colored race comprise about 250,000 or approximately 9 percent.

### Climate

**A**LTHOUGH the topography of Kentucky is undulating and varied with mountains in some regions, the difference in elevation is not sufficient to cause any marked variation of climate. Kentucky is essentially temperate with abundant moisture.

The average annual temperature of 54° to 58° Fah. ranges from 71° to 80° Fah. in the summer months to 32° to 40° Fah. in the winter months. Below zero temperatures occur with moderate frequency in the eastern part of the state during December, January and February, but rarely occur in the west where the average for January and February is 33° to 38° Fah. The first killing frost usually comes between October 13 and 23 while the last killing frost is seldom later than April 20. The growing season ranges from 174 to 195 days.

The average annual precipitation of 40 to 45 inches is heaviest in the mountains and Cumberland river basin, being about five inches more than the state average. September and October are the driest months with a range of 2.5 to 3.5 inches. The remaining months average 3.5 to 5.5 inches.

### Transportation

**K**ENTUCKY is well provided with water transportation facilities, having approximately 5,000 miles of navigable rivers. With the Mississippi on the west and the Ohio on the north, more than half of the state's entire boundary is traversed with commercially navigable waterways. In addition, the Tennessee and Cumberland rivers are navigable for their whole length across the state while the river Green also is of considerable commercial and industrial value.

Kentucky has 8,300 miles of roads under state maintenance, of which 6,350 miles are hard surfaced. Although the constitution of 1890 prohibited expenditure of state funds for highways, the development of roads done almost entirely by turnpike companies laid the nucleus of a system that has proved invaluable for the present expansion of linking the principal cities and other centers of industry and population.

The railroads operating in the state, which include nine Class 1 companies, have an aggregate mileage approximating 4,000 miles. Although the South central section of the state is lacking in railroad facilities in comparison with other sections, virtually every region producing mineral commodities is adequately served by railroads which in some sections form a network of local and interstate concerns.

Two major air lines operating in the state provide constant service across the state and link it with almost every part of the

country. Officially recognized air ports and fields are strategically located at 20 points throughout the state.

### Manufactures and Finance

**T**HE value of Kentucky's manufactured products amounted to \$504,897,342 in 1937, a gain of \$54,221,656 over the \$450,675,686 in 1935. Of this amount liquors derived from the state's heavy corn and grain production and availability of limestone water, comprise the largest single manufacture with over \$53,000,000. Meat packing ranks second with \$22,876,134 and petroleum refining is a close third with \$20,954,056. Other important manufactures are flour and other grain-mill products; paints, pigments and varnishes; furniture; and lumber and timber products.

In the 1,624 establishments located in the state there are 68,998 wage earners employed with a total payroll of \$66,248,664. The cost of materials, containers, fuel, and purchased electric energy in 1937 was \$323,001,676.

The total internal revenue collected in 1939 was \$136,272,138 of which \$13,427,964 represented income tax.

The aggregate resources of the state's 414 banks was \$544,576,000 in 1939. Capital stock, including capital notes and debentures, of these banks totaled \$36,957,000 while individual deposits were \$463,806,000. The two clearing house exchanges of Louisville and Lexington reported bank clearings as \$1,853,086,000.

### Agriculture

**A**LTHOUGH industrial development has been steadily and constantly increasing in Kentucky, the increased employment has been equalled by the rise of population and agriculture continues to occupy the largest single group, or about 40 percent.

Agriculturally, Kentucky ranks as one of the most important of the Southern states, the cash farm income in 1939 being \$146,766,000. From the 5,219,000 crop acres in 1939, crops yielded a cash income of \$66,762,000 while income from livestock and livestock products made up \$69,009,000.

There are 278,298 farms in the state of which 148,985 are operated by the owners and only 65,236 are mortgaged, with a total mortgage indebtedness of \$101,237,000.

The largest and most important single crop is tobacco and the 320,668,000 pounds produced in 1939 from the 373,000 acres harvested, yielded an income of \$58,800,000. Kentucky is the second largest producer of tobacco, being surpassed only by North Carolina. Corn is also an important crop having yielded 70,400,000 bushels in 1939 while production of wheat was 4,071,000 bushels. Among other crops adaptable to industrial use are sweet potatoes, hemp, etc.

Livestock products and dairy produce form an important part of Kentucky's agriculture. Livestock, including cattle, sheep, swine, horses and mules, number 4,302,000 and are valued at \$106,582,000. Cows and heifers kept for milk number 540,000. Production of creamery butter in 1938 exceeded 23,814,000 pounds valued at nearly \$8,000,000 while more than 7,900,000 pounds of cheese were also produced. In addition, nearly 61,200,000 pounds of evaporated milk were processed besides several other processed milks and buttermilks. Cash farm income from dairy produce in 1939 amounted to \$25,963,000 of which milk yielded \$15,789,000, eggs \$6,413,000 and chickens \$3,761,000.

### Timber

**T**HERE are 25,716,000 acres in the land area of Kentucky, yet the forest land is confined to 9,480,000 acres and of this latter 9,400,000 acres are regarded as commercial forest.

In contrast to the majority of other Southern states, the cordwood area of Kentucky, amounting to 4,230,000 acres far exceeds

the saw timber area of 2,820,000 acres. With 820,000 cords of softwood and 8,220,000 cords of hardwood, the total volume of the cordwood area is 9,040,000 cords, which together with the saw timber area, containing 13,740,000 cords or 1,940,000 cords of softwood and 11,800,000 cords of hardwood, gives a total state supply of about 22,900,000 cords.

The saw timber area comprising 565,000 acres old growth and 2,225,000 acres second growth, supports a total saw timber stand of 9,750,000,000 board feet or 1,250,000,000 board feet in softwood and 8,500,000,000 board feet in hardwood. Approximately 500,000,000 board feet of softwoods and 4,000,000,000 board feet of hardwoods are old growth, while second growth softwoods and hardwoods are 750,000,000 and 4,500,000,000 board feet respectively.

The total lumber sawed in 1938, amounting to 137,746,000 board feet, included 116,860,000 board feet of hardwood and 20,886,000 board feet of softwood.

According to the 1937 census, there were 147 establishments engaged in the lumber industry in Kentucky, the value of whose products totaled \$8,788,001. The cost of materials and power used therein amounted to \$3,802,593 and \$2,251,842 was paid in wages.

### Minerals

**M**INERALOGICALLY, Kentucky is one of the most important of the Southern states, ranking fifth in production value in 1938, the latest year for which statistics are available.

By far the largest part of the mineral production comprises coal, which totaled over 39,500,000 tons in 1938 and placed Kentucky fourth among the coal producing states of the nation.

Kentucky coal is of two kinds—bituminous and cannel—and is found mainly in two fields located at opposite ends of the state. Though bituminous is the most prolific, cannel is found in both fields and particularly strong beds are located in several of the eastern counties. While the varieties of coal differ in areas, possibly the greatest differential is that of sulphur content. In the eastern field all the coals are low in sulphur, seldom over three percent, and the majority of commercial seams are less than one percent. On the other hand, Dr. G. W. Burroughs, former Assistant State Geologist of Kentucky, states that the lowest county average of sulphur content in the western field is 3.22 percent. Coals of the western field, which cover nearly 5,000 square miles, have an average heat value of 12,000 B. T. U., while those of the eastern field, covering an area of over 10,000 square miles, have a heat value frequently approximating 14,000 to 15,000 B. T. U. Counties in which coal is commercially produced are indicated on the accompanying map, as are the other minerals so produced.

Great as is the production of minerals in Kentucky, nevertheless it is estimated that the average percentage of deposits of 24 minerals that are actively worked is less than 15 percent. Coal and petroleum, each averaging 75 percent, are not included.

Many of the minerals now produced are known to exist in commercial quantity other than in the deposits at present operated. Among these the following occur: asphalt rock, which is now produced in four counties, is available in at least seven others. Clays are among the most abundant of Kentucky minerals, over 340,000 tons valued in excess of \$1,000,000 having been produced in 1937. In spite of that fact there are virtually unlimited quantities in untouched deposits, and the total supply includes varieties suitable for almost every clay-making purpose.

Coke, which is produced commercially on a large scale in only one county and is of the by-product variety, is available for production in numerous places from suitable coals.

Fluorspar deposits, which are the second largest in the United States, are confined to a comparatively few counties. Nevertheless, additional veins are known from those now being worked, and since these are a source of lead and zinc ores, their importance is obvious.

Limestone occurs in various forms in almost every county of the state, and though not all of it is of the building kind, inexhaustible quantities occur for other purposes. Sand and gravel also exist in many locations other than those now worked.

Besides the foregoing, there are a number of minerals available in sufficient quantity for commercial production, which are not now so produced or only in a desultory manner.

Aragonite, sometimes called Kentucky or Mexican onyx, exists in large deposits in and along the borders of several counties of the west. In the central part of the state, several counties contain veins of barytes in commercial quantity. Large quantities of marble are found in many counties, particularly adjacent to the Kentucky river where they outcrop. These marbles are not metamorphosed limestones but limestones that can be polished and are suitable for both building and ornamental purposes. Marl, in the form of calcareous shales and clays, is found in various localities and the deposits are described as enormous.

Carbon black was produced at several places for a number of years, but with extension of pipe lines, demand for natural gas

for domestic and industrial use precludes its diversion for carbon black manufacture.

Large areas of iron ore are known to exist in the state, but their low grade has not yet occasioned any noticeable demand for commercial production.

A similar situation exists regarding the state's oil shale reserves, which have been conservatively estimated at 100 billion tons, and a content of one-half barrel per ton. These, and the inexhaustible quantities of impure limestones, offer unusual opportunities for the production of rock wool and other insulating products.

Phosphate rock, which has been mined occasionally in the past, occurs in considerable commercial quantity throughout the Blue Grass region, but its production is restricted by the agricultural value of the land.

Calcite, lithographic stone and ochre are three of the state's other minerals whose commercial possibilities need to be explored.

### Electric Power

**I**N the matter of electric power generating facilities, Kentucky is so situated as to be able to supply virtually any reasonable demand that may come from expansion of industry.

While there are 43 plants operating in the state, the main transmission lines form three principal groups. The one in the east supplies, through its vast network, power to a large portion of the mining industry and is connected with all adjoining states. The central system, supplying most of the larger cities, is also connected with the eastern and western systems. The system in the western part of the state includes the coal fields and other mining plants in its service.

Steam power plants, numbering 28, have an installed capacity of 248,768 kilowatts and the four hydroelectric plants, located at Louisville, Dix Dam and Dam No. 7 on the Kentucky river, have a combined installed capacity of 111,060 kilowatts. The remaining 11 plants are internal combustion engine plants with 3,068 kilowatts capacity.

Production of electricity in Kentucky during 1939 totaled 913-, 409,000 kilowatt hours. Of this amount, 514,769,000 kilowatt hours were produced by steam plants and 398,640,000 kilowatt hours were the output of water power plants.

### Taxation

**N**O state provision has been made in Kentucky for industrial exemption from taxation. However, new industries may be exempted from city taxes for a maximum period of five years.

Manufacturing machinery, raw materials and intangible property (except franchise values) are exempt from all local taxes, being subject to state ad valorem taxes only.

The state income tax applying to corporations is four percent of the net income.

There is a corporation license which is a tax on every corporation owning property or doing business in Kentucky, except foreign insurance companies, banks and trust companies, and corporations which pay a franchise tax. The tax is 70 cents on each \$1,000 of asset value of capital stock represented by property owned and business transacted in Kentucky.

The maximum tax rates which generally apply throughout the state are: counties, 70 cents; cities and school districts, 75 cents to \$1.50 (graduated according to class). Assessment is based upon a fair cash value in a voluntary sale but indications are that a wide range of ratios prevail, the average being between 60 and 70 percent. The assessed value of all taxable property is \$2,818,573,712.

### Labor and Wages

**M**ORE than 70 percent of Kentucky's population is rural. The average population density is 65 persons per square mile, ranging from 22 per square mile in Livingstone County to 918 per square mile in Jefferson County. Ninety-four of the state's 120 counties have a density less than the average. According to the 1930 census there were only 13 cities with a population between 10,000 and 70,000. Louisville's population in 1940 is 318,713. Only .84 percent of the people are foreign born and 87.8 percent are natives of the state.

There is an ample supply of capable and willing labor for both skilled and unskilled work, nearly 17 percent of the gainfully employed population being engaged in manufacturing (exclusive of mining).

Wages vary both with the industry and the locality. Common labor ranges from 25 cents per hour and organized skilled labor is \$1.25 and up per hour. WPA hourly rates vary from 25 to 44 cents hourly for unskilled labor; 39 to 53 cents per hour for semi-skilled labor, and 42 to 69 cents per hour for skilled labor. In such instances as the building trade, the highest rates paid by WPA range from 43 to 73 cents per hour. All rates are based on monthly earnings for 130 hours work.



Four of Baton Rouge's largest manufacturing plants: Standard Oil Company of Louisiana . . . Ethyl Gasoline Corporation . . . Solvay Process Company . . . Louisiana Station of Gulf States Utilities Company.

## BATON ROUGE, LOUISIANA

**L**OCATED on the first highland above the Gulf of Mexico on the Mississippi River stands Baton Rouge, the capital city of Louisiana. At the head of deep water navigation on the Mississippi, ocean going vessels come to this port at all seasons of the year. Baton Rouge is an important port for exports, imports and coastwise shipping.

With the Mississippi and Illinois river navigable for barges, shipments of industrial and agricultural products can be brought to Baton Rouge from the Chicago district and from as far north as Minneapolis and St. Paul.

The great industrial district of the Ohio Valley as far as Pittsburgh can bring its products to Baton Rouge by water, and this city is the first port at which such products can be transferred from rail to ship and from barge to ship for export.

Three trunk lines of railroad give Baton Rouge excellent rail service and this combination of rail and water transportation provides Baton Rouge with exceptionally low freight rates.

Baton Rouge is also a gateway and distributing point for a great Southwest territory and South and Central American ports.

The proximity of important raw materials such as oil, sulphur, salt, limestone, lumber, sand and cotton provides these materials in unlimited quantities to industry, especially in the chemical and textile lines.

A splendid labor situation, excellent water supply and fine climate are other important factors which appeal to the industrialist.

The largest steam plant in the South is Louisiana Station of the Gulf States Utilities Company which furnishes steam and electrical energy to surrounding industries. This plant cost \$11,000,000 and is unique in that it has been a factor in attracting several large industrial plants to Baton Rouge. There is available from the output of this plant low cost steam and electrical energy, and industries seeking new locations will find this factor worthy of investigation. Nearby industrial sites with rail and water connections are available.

Baton Rouge has three strong banks.

The Louisiana State University is located here and with

a well rounded public school system adds to the value of Baton Rouge both as a homesite and as a site for industry.

The Standard Oil Company of Louisiana has here the South's largest oil refinery, refining oil and all of its by-products and has recently announced plans for the construction of a plant to manufacture Buna Rubber. The plant is to cost \$1,000,000.00 and will be the first in America.

Potential Southern markets and the proximity of raw materials induced The Solvay Process Company to invest over \$6,000,000.00 for the manufacture of caustic soda, soda ash and chlorine.

The Ethyl Gasoline Corporation has built a \$20,000,000 plant for the manufacture of Anti-Knock Compounds and required intermediate materials. Within this plant operations are carried on both directly by the Ethyl Gasoline Corporation and by contract with E. I. du Pont de Nemours & Company.

*Other manufacturing plants finding Baton Rouge an advantageous site are:*

*The C. C. Mengel Company with an investment of \$3,000,000.00 for the manufacture of furniture veneer and ply wood.*

*The Consolidated Chemical Company with an investment of \$2,000,000.00 for the manufacture of sulphuric acid.*

A new \$12,000,000.00 rail and highway bridge which will be opened for operation this summer will give direct rail and highway connections between the east and west sides of the Mississippi River.

Baton Rouge is served by two excellent daily newspapers: *State Times* (afternoon) and *Morning Advocate*, and by Radio Station WJBO (1000 watts), affiliated with the National Broadcasting Company.

Additional information will be furnished by the Chamber of Commerce to anyone interested in Baton Rouge as a location for industry or commercial business.

## BATON ROUGE CHAMBER OF COMMERCE CITY OF BATON ROUGE



# LOUISIANA



Louisiana's production of petroleum, which ranks third among the Southern states, is the basis for the state's principal industry employing over 7,000 people and having an annual output exceeding \$122,000,000.

## NEW INDUSTRIES FOR LOUISIANA

BY

Ernest Lee Jahncke

*Executive Director,  
Louisiana Department of Commerce and  
Industry*

NO one place in Louisiana is better indicative of the strides the state has made in the industrial development which is stimulating the entire South than the New Orleans wharves, a changed picture from the steamboat days of the last century when bales of white cotton and bags of coarse sugar were piled high, waiting to be stored by husky stevedores in the holds of ships that would sail the seven seas.

Today, cotton and sugar, products of two of the oldest and still strongest industries of the Pelican State, are seen—in bales and in bags—but also in a thousand disguises made possible by achievements of modern industries—principally chemurgic industries. Yet, cotton and sugar in any form are but a small part of the long parade of raw and manufactured products which, stored in the modern warehouses of the 40-mile waterfront of the South's leading city, attest the strength and versatility Louisiana has gained in the industrial world.

Louisiana is not yet, and probably never will be, entirely an industrial state. Louisiana is primarily agricultural, and her fertility of soil and excellent climate will continue to make her a leader in farm production.

Louisiana is also a rich mineral producing

area. From her oil fields, which extend from the northern boundary of the state into the Gulf of Mexico, comes production which makes the state fourth producer of petroleum. From the world's largest natural gas field in north Louisiana, comes power to supply cities all over the South. From the vast salt mines of the coastal lands in the southern part of the State comes enough salt to supply the needs of the world for thousands of years, and from her sulphur mines the largest quantity produced in the United States.

Yet with these and other natural mineral resources, which themselves offer possibilities for additional development (later to be discussed), it is her agricultural products which Louisiana wants most to adapt to her new industries, wants most for her new industries to adopt.

Sugarcane, cotton, corn, rice, sweet potatoes,—the old "money" crops—and tung oil, ramie, soybeans, flax, okra—comparatively

new crops for Louisiana soil—are raw materials Louisiana has to offer chemurgic industries.

Chemurgy, as such, is a relatively new field. Only in the last few years has it been in the scientific and industrial limelight. But for many more years have men been quietly working in their laboratories to find ways of converting surplus perishable commodities into products of many and different uses—breaking down farm produce into its component parts and rebuilding those parts into things entirely new.

Chemurgic industries have already been established in Louisiana. Louisiana's staple money crops have already been sent through the laboratories of chemurgic science. Cotton is no longer just a source of material for fabrics—by various processes it has become road base, explosives, cellophane, felt, celluloid, lacquer, photographic film, shortening, furfural, etc. Sugarcane has ceased to be only a source of sugar and molasses, and has become a source of wall board and alcohol. Rice has ceased to be merely a food, but has become a source of materials for linoleum, artificial silks, paints and enamels, shatter-proof glass, and rubber substitutes.

Already in Louisiana there are a number

of manufacturing plants which have as the basis of operation the conversion of these Louisiana farm products into various articles. Yet the supply of products exceeds the demand for these uses, and the state is eager to secure additional such industries, to use the available supply and in time, as need demands, to afford farmers opportunity for increased plantings.

These basic crops, however, are by no means the only ones to which Louisiana gives her attention.

Tung oil, used in paint, varnish and linoleum manufacture, which has been imported into the United States from China for more than 50 years, is just now getting a foothold in domestic production. Louisiana, with parts of the extreme southern states, constitutes the only area in the United States where this oil can be produced. Today more than 50,000 acres in the state are planted in tung trees. Louisiana has at the present time three plants for the processing of tung nuts to oil. These, it might be said, were established experimentally, but they have proved profitable and successful. The increased planting of tung trees in Louisiana, and the increased production of matured trees, however, create a definite need for additional processing plants, and for additional tree planting interests.

Processing of starch from sweet potatoes for use in textile and paper mills has already had its foundation laid in Louisiana, but present exceptional opportunity for further development. Pioneering of sweet potato starch has been done in Louisiana and in Mississippi, and at the present time several processing plants are being established. In the next few years domestic sweet potato starch should, by present indication, have an equal footing with the imported starches used now. Several areas in Louisiana present excellent locations for sweet potato processing plants because of a larger yield per acre, although potatoes are widely cultivated in the state.

Two other valuable newcomers to Louisiana farms are ramie and castor, both of which have definite possibilities as sources of fiber, although their use by industries in the United States has been restricted by expenses of importation from the Orient. Experiments have shown that in the lands of south Louisiana, ramie can be grown much more cheaply than in China, and this taking into consideration the high standards of labor prevailing in the state, as compared to the cheapest kind of manual labor available in China. Difference in production costs is largely accounted for by the greater natural fertility of Louisiana soil, and lower costs of fertilizers. One factory for processing ramie has been established already in south Louisiana.

No extensive or commercial planting of castor has been done in Louisiana to date, but

the state is interested in more lengthy investigation of the possibilities of the castor plant becoming a leading money crop for Louisiana farmers, and the many productions of the plant becoming articles of manufacture and export.

There is another aspect of the industrialization of farm produce in which Louisiana is interested which does not come into the field of chemistry. This is food preservation or canning. In every part of the state large areas are devoted to growing truck vegetables, which find ready markets in Louisiana and in northern and eastern centers during season. There is a definite need for vegetable canning plants in Louisiana, and these would be practically assured of year 'round operation because of the good climatic and soil conditions under which Louisiana farmers have a never ending growing season. Vegetable canning plants should experience no problems much different from the seafood canning plants which flourish in the Louisiana coastal area.

### Chemical Industries

Louisiana's chemical resources—principally oil, natural gas, salt, sulphur and timber—with smaller but sufficient quantities of sand, shell and lime, offer many possibilities for industrial development.

Petroleum production in the state in 1939 reached 91,902,955 barrels. Louisiana's industrial roster includes a large number of oil refineries and other industries which consume a great part of the oil production in manufacture, while much of the oil is exported. Possibilities for additional industries in the petroleum field include those engaged in the manufacture of alcohols, aldehydes, acids, resins, naphthenates, solvents, chlorinated and sulphurized products, wax products, plastics, and oxidized petroleum products.

Louisiana's natural gas, the production of

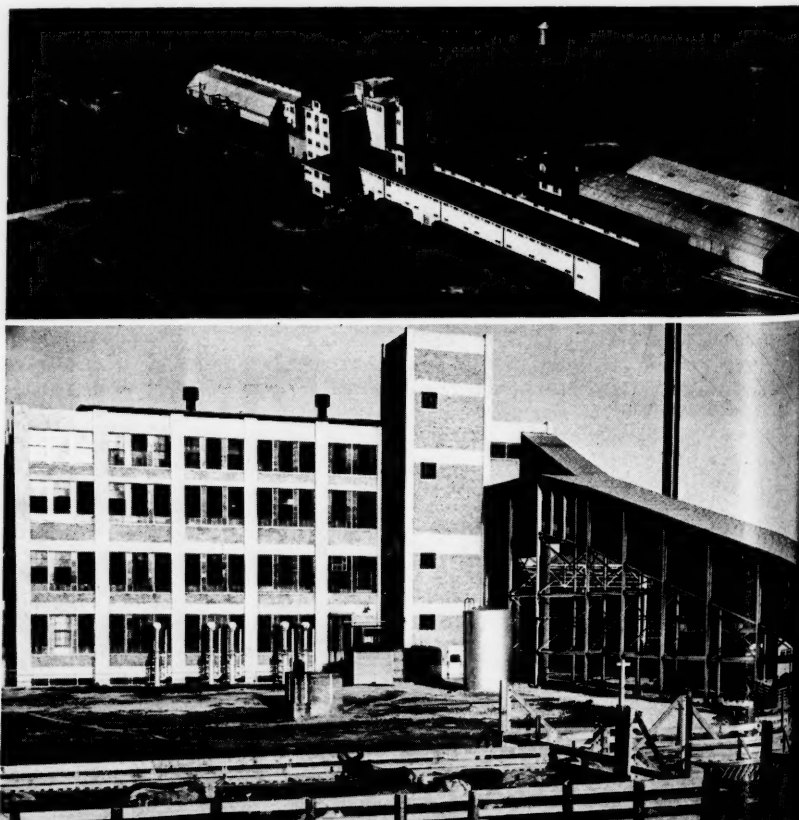
which in 1939 was 335,877,704,865 cubic feet, is produced principally from the Richland gas field near Monroe, in North Louisiana, although considerable quantities come from oil fields of the State, and as by-products of refining. Several carbon black plants are already in Louisiana, but manufacturing of hydrogen, carbon tetrachloride, chloroform, aldehydes, alcohols, acids, and ethers offer additional enterprises.

Salt, which is supplied by four outstanding mines, was produced to 607,194 tons in 1939. Salt offers a raw material for the manufacture of saltcake, hydrochloric acid, caustic soda, chlorine hydrochlorites, metallic sodium, and chlorates.

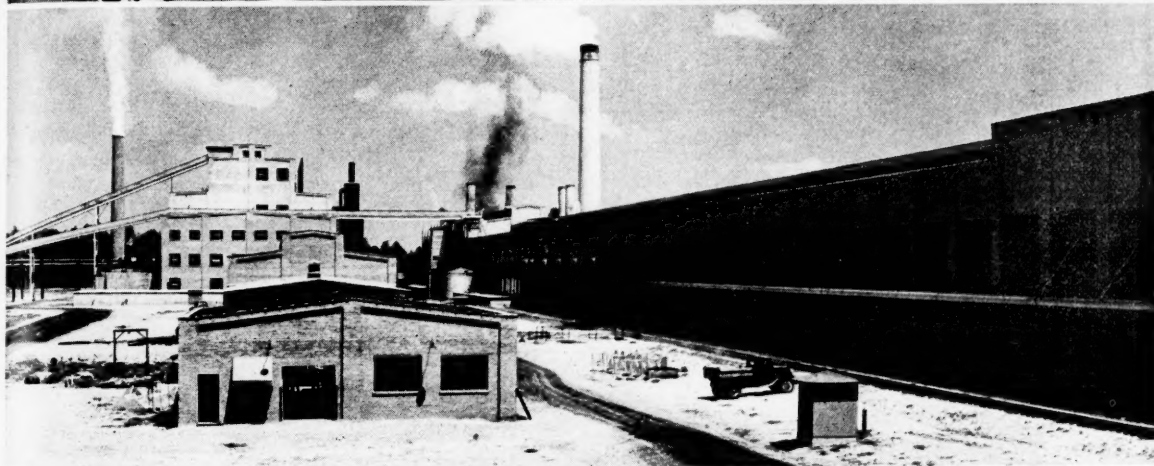
Sulphur, which comes from the Grand Ecaille mines near the mouth of the Mississippi River, had an increased production of 364,850 tons in 1939. Sulphur products suitable for manufacture include sulphides, polysulphides, sulphates, sulphur chlorides, carbon disulfide, sulphur cements, sulphur resins and plastics.

Numerous timber industries—paper mills, and wood working plants—operate in every part of the State. Production figures for 1939 reached 1,024,425,987 board feet. Additional industries might find a field for ground wood, sulphite, pulp, rayon pulp, paper specialties, fatty acids, abietic acids, terpin, terebene, terpinol, synthetic camphor, menthol, pinene, terpene resins, pine oil, resin soaps, resinates, tar, tar acids, rayon and structural board.

Miscellaneous industries which would find raw products among the many resources of the state include those for the manufacture of lignite products, paper mill supplies, oil refinery supplies, matches, paints, lacquers, asphalts, asphalt products, glass, cements and adhesives, refractory cements, corrosion-proof paints, fish products, soap, fertilizers, cleaning compounds and pine oil products.

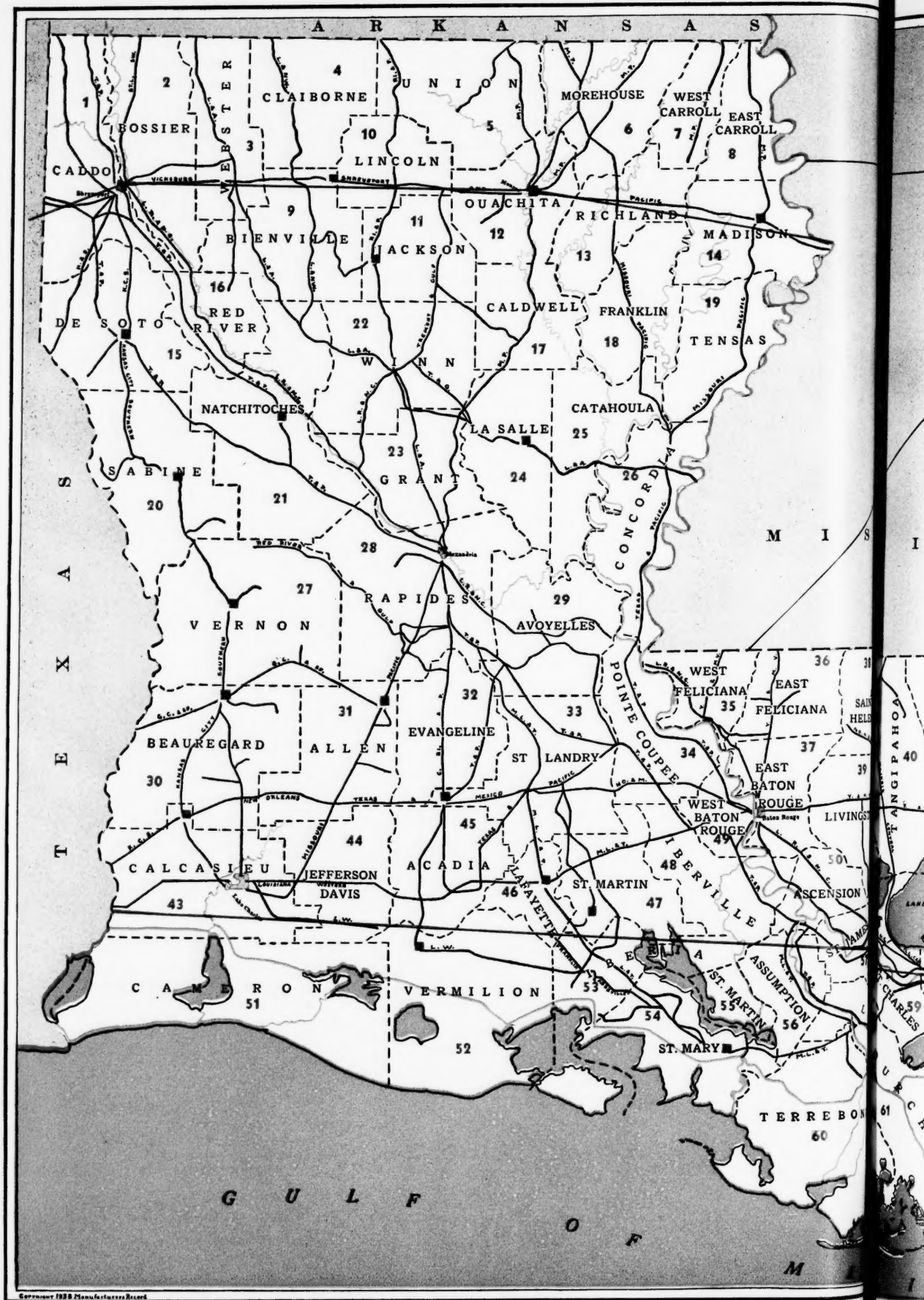


*Top—The Louisiana State Rice Company plant at Baton Rouge is the largest single rice milling plant in America, contributing a large part to the state's total rice industry having an output approaching \$20,000,000. Bottom—The stockyards and packing plant of Swift and Company at Lake Charles is the largest such plant in the South.*



Among Louisiana's largest industrial plants are: (top to bottom) the Celotex Corporation plant at Marrero, where wall board and other products are manufactured from bagasse, the waste sugar cane; the \$6,000,000 plant of the Southern Kraft Corporation at Springhill is the largest of seven pulp and paper mills; at the Dupont-Ethyl Gasoline Corporation plant near Baton Rouge is made one-third of the nation's tetra-ethyl lead; the sugar refinery of Godchaux, Inc., at Reserve.





Its principal raw materials and transportation facilities offering opportunities for industry, with additional facts on the reverse side pertaining to industry and its growth within the state.

### Minerals

**Limestone—**22, 32

**Natural gas**—1 to

**Natural gas**—1 to 10, 12, 13, 15, 16, 20, 28, 33, 37, 43, 45, 47, 48, 50 to 55, 60 to 63

**Petroleum**—1 to 5, 9, 10, 15, 16, 21 to 24, 28 to 33, 37, 43 to 45, 47, 48, 50 to 59, 65

**Salt—** 22, 48, 51, 53

**Sand and gravel**—1, 3, 5, 12, 23 to 25, 27, 28, 32, 35  
to 42, 53, 64

**Shell**—42, 43, 51, 54, 59 to 61, 65

**Sulphur—** 63

## Timber

**Cypress-tupelo**—2, 8, 10, 13, 14, 18, 19, 20, 24 to 27, 32  
to 34, 37, 39, 40, 43, 47, 48, 50, 53, 55 to 65

**Longleaf—** 9, 20 to 24, 27, 28, 30 to 32, 40 to 44

**Shortleaf-loblolly-hardwood—** 1 to 6, 9 to 12, 15, 20 to

**Loblolly-hardwoods**—2, 4 to 6, 9, 11, 17, 20, 23, 24, 27, 28, 30 to 32, 35 to 40, 42, 43, 45

**Mixed bottomland hardwoods**—1 to 3, 5, 6, 12, 15, 16, 20 to 23, 27, 28, 30, 31, 42, 43

**Oaks-mixed hardwoods**—6, 7, 10, 12, 13, 18, 32, 33, 36, 37, 50, 52, 53

**Red gum-mixed hardwoods**—6 to 10, 13, 14, 17 to 19, 25, 26, 28, 29, 33 to 35, 37, 47 to 50, 54, 56, 58, 59

**Naval stores—** 21, 27, 28, 40 to 43

### **Agricultural products**

**Cane sugar**—28, 29, 33, 35, 37, 46 to 50, 52 to 61

**Corn**—all parishes

**Cotton**—1 to 37, 40, 41, 43 to 47, 52

**Oranges**—30, 31, 42, 43, 51, 52, 63

**Peanuts**—1 to 5, 10 to 12, 15 to 18, 20 to 25, 27, 28, 35 to 42

**Pecans**—1 to 6, 8 to 13, 15 to 24, 26 to 37, 39 to 63, 65

**Rice**—31 to 35, 37, 43 to 53, 55 to 59, 62, 63, 65

**Soybeans**—2, 5, 6, 14, 17, 19, 21, 22, 28, 29, 32 to 37, 39 to 41, 45, 49, 52, 60

**Sweet potatoes**—28, 33, 35, 45 to 47

**Tobacco (Perique)—57**

**Fisheries**—51 to 54, 60 to 65

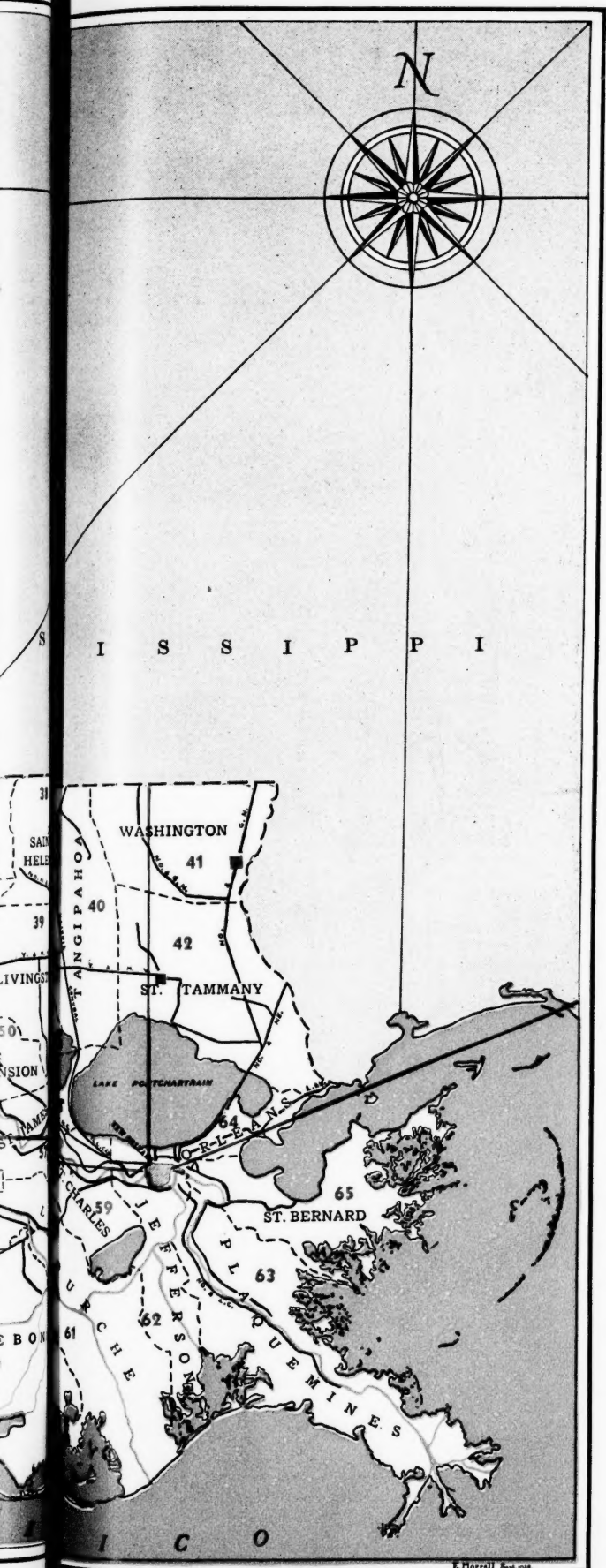
**Natural gas is available for consumption in all parishes.**

## Railroads

### Navigable waterways

## Airlines

■ Airports—also at principal cities printed in red



# Louisiana—

## With a Wealth of Industrial Opportunities

**L**OUISIANA, sometimes referred to as "The Creole State," or "The Pelican State," dates its history from 1528 when Narvez, the Spanish explorer, discovered the mouth of the river Mississippi. In 1687, La Salle, who named the state for Louis XIV, made the first effort at colonization—an attempt which ended with his murder in Texas where he landed by mistake. In 1699, Iberville landed at what is now New Orleans but the colony was soon moved to Mobile. Ten years later another attempt was made and it, together with another venture in 1717 proved financially unsuccessful, but by this time a colony had been established which continued with little change until in 1762 France ceded the territory to Spain by the secret treaty of Fontainebleau. In 1800 Louisiana was re-ceded to France by another secret treaty and the fact became known only 20 days before the territory was purchased by the United States in 1803 for \$15,000,000. In 1812 Louisiana was admitted to statehood in the Union.

Ranking 30th in size with 48,506 square miles of which 3,097 square miles are water area—the fourth largest water area of the Southern States, Louisiana had an estimated population of 2,903,000 in 1937 to rank 22nd among the states. Approximately one-third of the population are negroes.

### Climate

**E**XTREMES of climate are virtually unknown in Louisiana. During the summer months there is little variation of temperature from the state average of 81° Fah. In the winter the average temperature ranges from approximately 56° Fah. in the south to 47° Fah. in the north.

The average annual precipitation is about 55 inches, the heaviest rainfall being in June, July and August while the minimum occurs in October and November. The remaining months are fairly constant with an average of 4½ inches.

Killing frosts seldom occur before the end of October and the last one is usually prior to the close of March.

### Transportation

**L**OUISIANA possibly is unique among all the states in that its mileage of navigable waterways almost equals the mileage of railroads, there being close to 5,000 miles of each. In both instances, the state is adequately traversed with facilities affording transportation in practically every direction and particularly directed toward Baton Rouge and New Orleans where coastal and oceanic services are available to all parts of this and foreign countries. The value of merchandise imported and exported through the New Orleans Customs District of Baton Rouge and New Orleans in 1939 was \$97,757,580 and \$181,342,687 respectively, making a total for the state, exclusive of the foreign trade passing through Lake Charles, which is classi-

fied in another customs district, of \$279,100,267. New Orleans ranks second among the ports of the nation.

The highways of Louisiana comprising 39,800 miles, of which 2,350 miles are concrete, 1,630 miles are asphalt and 13,560 miles are gravel, provide a ready means of communication between the principal cities of the state and are serviced by 33 individual bus lines and 35 motor freight lines.

Commercial airlines operating across the state in the north and the south connect Louisiana with the metropolitan centers of the east and west while from New Orleans air transport makes direct contact with Chicago and all parts of the country.

### Manufactures and Finance

**T**HE value of Louisiana's manufactured products in 1937 amounted to \$580,839,828 representing an increase of \$147,320,111 over the 1935 total of \$433,519,717. Outranking all other industries is that of petroleum refining with products valued at \$122,151,945 and a payroll aggregating \$7,120,421 for the 4,483 employees. Containers, materials, etc. represented a value of \$98,459,299. Sugar refining ranked second with \$75,463,193 and lumber and timber were third with \$44,496,047. Other important industries with the value of their respective products are: paper, \$28,858,171; rice cleaning and polishing, \$17,808,261; wood and other pulp, \$13,747,894; cottonseed products, \$12,702,413; and chemicals which exceeded \$12,000,000.

The total cost of materials, containers, fuel, and purchased electric energy for all industries in 1937 was \$380,984,102 while the wages of the 76,057 employees in the 1,684 establishments totaled \$60,203,023.

Of the total internal revenue of \$45,892,078, the federal income tax comprised \$15,732,301 in 1939.

In the state's 146 banks, with capital stock of \$25,728,000, reporting to the Comptroller of the Currency in 1939, aggregate resources were \$559,147,000 and individual deposits totaled \$504,805,000. Bank clearings for the two reporting exchanges at New Orleans and Shreveport amounted to \$2,187,369,000.

### Agriculture

**L**OUISIANA is unique from an agricultural point of view as it is in several other aspects. Due to its climatic conditions and advantageous soils, it is possible to grow virtually any and every crop. In this respect Louisiana is able to supply foodstuffs for its own people as well as send large quantities to distant markets. In addition, the state grows large crops of products suitable for industrial purposes.

In 1939 the total cash farm income of \$134,604,000 included \$27,001,000 from livestock and livestock products and \$86,-



419,000 from crops. The full significance of Louisiana's crops can be seen from the fact that only six other Southern states derived a larger cash income from crops and yet there were only four states with a smaller crop acreage.

The most important crop is cotton and in 1939 the production of 750,000 bales yielded an income of \$34,308,000 while the 333,000 tons of cottonseed added an extra \$5,182,000. Among the other crops sugar cane is outstanding. Of the 5,798,000 tons of sugar cane produced in the United States in 1939, Louisiana contributed 5,084,000 tons. Rice is another important crop, yielding \$13,925,000 from 20,597,000 tons. Still other crops produced on a commercial scale and adaptable to industrial use are corn, sweet potatoes and peanuts, production of which was 23,325,000 bushels, 6,935,000 bushels and 18,800,000 pounds respectively, while in St. James parish is grown the only Perique tobacco in the United States. Fruit and vegetables also are cultivated extensively, the income from commercial and non-commercial truck crops in 1939 amounting to \$4,788,000 of which \$2,307,000 was derived from market sales and \$59,000 from sales for manufacturing purposes. Dairy products yielded \$6,627,000 including \$2,240,000 from eggs.

On the state's 170,216 farms are 2,710,000 cattle, sheep, swine, horses, and mules valued at \$62,221,000. The total mortgage debt is \$55,225,000 on 50,447 farms. The remainder of 119,769 are unencumbered.

### Fisheries

WITH an abundance of both fresh and saltwater commercial varieties of fish, fisheries occupy an important position among Louisiana's industries. In 1939 saltwater fish production was 19,883,487 pounds valued at \$2,379,496. To this must be added 82,960,600 pounds of shrimp valued at \$2,903,621 and 864,874 barrels of oysters with a value of over \$3,000,000. Fresh water fish in the amount of 20,122,132 pounds yielded almost \$1,938,200.

### Timber

THE forest land of 16,210,000 acres in Louisiana amounts to slightly more than half the total land area of 29,062,000 acres. Of this forest area, commercial forest covers 16,185,000 acres including 10,055,000 acres of sawtimber.

This sawtimber area comprising 42,425,000,000 board feet is made up of 16,810,000,000 board feet of softwoods and 25,605,000,000 board feet of hardwoods. In softwoods old growth accounts for 4,400,000,000 board feet and 12,420,000,000 board feet are second growth. In hardwoods 13,910,000,000 board feet are old growth, and second growth occupies 3,340,000 and 6,710,000 acres respectively.

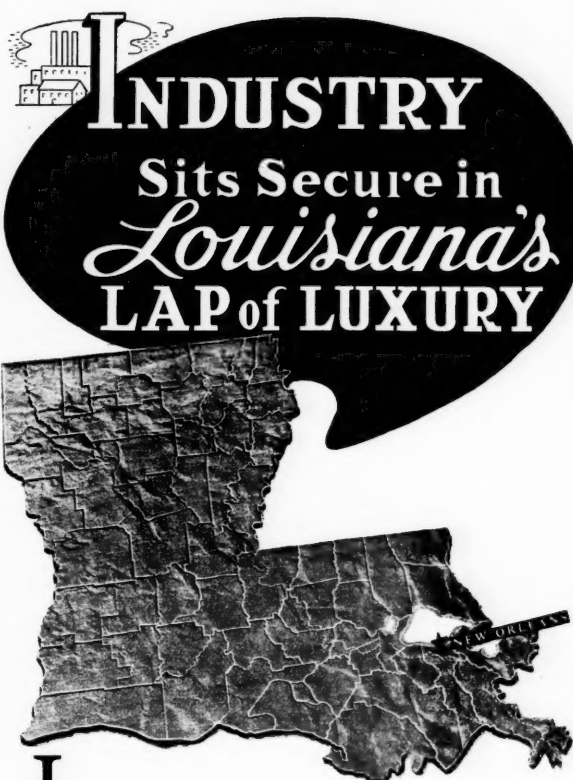
On the cordwood area of 2,045,000 acres are 9,325,000 cords—2,130,000 cords of softwood and 7,195,000 cords of hardwood. To this should be added 74,580,000 cords on the sawtimber area, of which 58,905,000 cords are hardwood and 15,675,000 cords are softwood, making a total supply for the state of approximately 84,000,000 cords if the supply on restocking areas be included.

The total lumber sawed in 1938 was 946,258,000 board feet including 593,564,000 board feet of softwoods and 352,694,000 board feet of hardwoods. The variation between the two types of woods in consumption and timber stands is evidence of the industrial opportunity which the timber of Louisiana offers, particularly with regard to the pulp and paper industry.

According to the 1937 census, the value of lumber products was \$44,496,047 in the state's 243 establishments. The cost of materials and power was \$17,914,296 and the payroll, \$12,581,612.

Spanish moss, which festoons the trees in a large area of the state's forests, yields an annual revenue of over \$1,000,000 and appears to exist in an inexhaustible supply.

Another of the state's forest industries is naval stores. The entire production of these commodities in the United States is confined to eight Southern States. In the season 1939-1940,



LOUISIANA, hub state of the prospering South, holds in its lap Industry's every requisite—an abundance of raw materials, natural gas, the nation's fifth largest oil reserve and a near inexhaustible supply of timber. Its rich farm lands provide fresh produce enough to feed millions of men—cotton plantations enough fiber for all the nation's textile mills! It is the largest producer of rice and sugar in the nation. It is criss-crossed with rail, highway and water routes and boasts the South's largest port. It is in itself a market for \$689,599,000 worth of merchandise!

A market completely covered by The Times-Picayune and New Orleans States!

Write for the Booklet—  
"A Line on the New Orleans Market"

**The Times-Picayune**  
MORNING ★ EVENING ★ SUNDAY  
**NEW ORLEANS STATES**

Representatives: NOEE, ROTHENBURG & JANN  
New York Chicago Detroit Atlanta San Francisco

Louisiana produced 11,304 50-gallon barrels of gum turpentine.

aggregated \$45,892,078 of which \$7,952,313 represented corporation income tax.

### Mining and Minerals

**T**HE comparatively small variety of minerals produced in Louisiana at present is largely off-set by the available quantity and value. Since 1910 the value of minerals produced has increased approximately 16 times until in 1937 it reached \$182,118,905. In 1939, 91,903,000 barrels of crude petroleum were produced while the quantity of natural gas produced was nearly 336 billion cubic feet. In the same year natural gas was the basis from which over 68,000,000 pounds of carbon black were produced. The remaining two minerals of outstanding importance are salt and sulphur, production of which was 607,194 tons and 364,850 tons, respectively, in 1939.

On the accompanying map are indicated, by parishes, those minerals which at present are commercially produced, but large as this output is, it is authoritatively stated that, minerologically, the surface has only been scratched. Forty-five parishes produce oil or gas or both; the 19 remaining as yet unproductive parishes are all potential producers, many having had good shows which make them attractive areas for exploration. Indications of Louisiana's mineral future are seen in the fact that a considerable number of the fields are centered in salt domes with oil, salt, sulphur, and limestone all being present.

Virtually all the state's mineral products are valuable not alone in themselves but as sources of numerous chemicals for an ever widening circle of industries.

### Taxation

**B**Y a vote of the electorate at the election in 1936 the State Constitution was amended so as to authorize the Governor, or the Board of Commerce and Industry with the approval of the Governor, to enter into an agreement with the owners of any new industry to be established in the state or those making an addition to any industry already existing in the state, for the exemption from property or ad valorem taxation. Provision is made that no exemption shall be effective for a period longer than ten years from the date of contract.

State taxes generally applicable to corporations include a general property tax of 5.75 mills; a corporation tax of 1/20 of one percent of the amount of capital stock employed within the state with a minimum of \$10 and a maximum of \$2,500; a corporation franchise tax of \$2 per \$1,000 with a minimum of \$10; and an income tax of four per cent on net taxable income—returns are not required for less than \$3,000. In addition there exist severance taxes of varying rates according to specific resources, an organization tax, and special license taxes similar to those prevailing in most states.

The parish property tax is four mills. Assessment is based upon 100 percent of value but this is liberally construed.

The assessed value of taxable property in the state in 1939 was \$1,367,839,588, while federal tax receipts in the same year

### Electric Power

**E**LECTRIC power facilities are available throughout the state and produced 1,885,223 kilowatt hours in 1939, all of which originated from fuel-operated plants since there are no hydroelectric plants.

The 66 plants include 13 steam power plants with a generator capacity of 378,496 kilowatts; and 53 plants operated by internal combustion engines with a capacity of 30,738 kilowatts.

In addition to the expansion of some of these plants which now is going forward, an adequate supply of power is assured by the network of transmission lines with interstate connections.



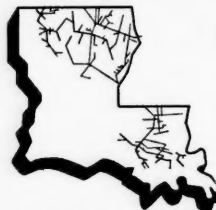
#### Look to Louisiana

—Where industries' raw-stuffs are nearby and can be manufactured with economy.



#### Come to Louisiana

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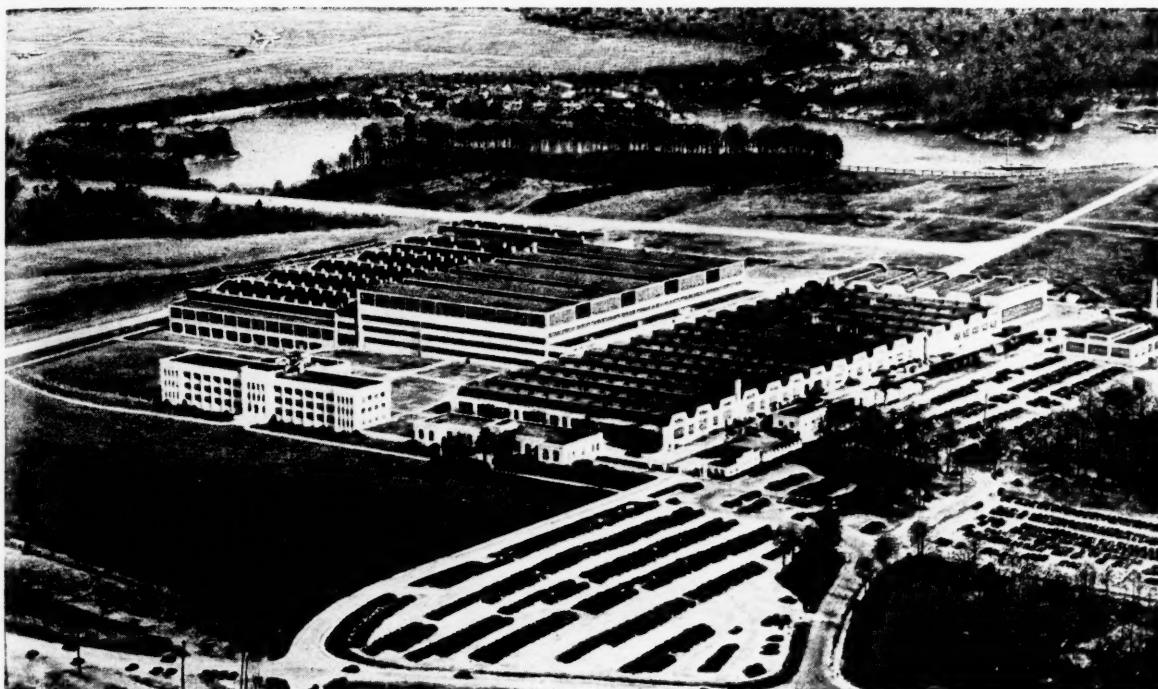
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# MARYLAND



The Glenn L. Martin Company plant at Middle River within the Baltimore Industrial Area is the largest single unit aircraft manufacturing plant in the United States. Plans are now under consideration for enlarging this establishment to more than double its present capacity.

## MANUFACTURING IN MARYLAND

MARYLAND is one of the country's oldest and most productive manufacturing states. The annual gross value of its industrial output normally exceeds one billion dollars, while the value added by manufacture is upward of \$430,000,000. The 2,700 factories operating there afford employment for 146,000 wage earners and 18,000 salaried employees, and the total outlay for wages and salaries, according to the 1937 Federal Census, amounted to nearly \$200,000,000. The combined expenditures in that year for materials, electric energy, and supplies for use in manufacture was approximately \$665,000,000.

Despite its comparatively small area, Maryland has the second largest manufacturing industry of any state east of the Mississippi river and south of the Mason and Dixon Line. Although North Carolina of this group of states ranks higher than Maryland in value of manu-

BY  
H. Findlay French, *Director*  
*Industrial Bureau*

AND  
W. S. Hamill, *Director*  
*Maryland Development Bureau,*  
*Baltimore Association of Commerce*

factured products, the per capita value for Maryland is substantially greater.

The development of manufacturing in Maryland began shortly before the end of the Colony's status as a Royal Province in 1715. This long association with the mechanical arts had its origin in the necessity of supplying the simple needs of the colonists. Their inability to obtain adequate supplies of manufactured goods from the mother country, together with the natural handicaps of their

new homeland, compelled the colonists to exercise a degree of resourcefulness which later resulted in a series of "firsts" in Maryland which has been of great value to the entire nation. Not only were some of the largest of Maryland's present industries born in the early years of the Colony's manufacturing efforts, but to these pioneer efforts must be attributed in part the establishment of some of the country's largest manufacturing industries.

Among the early commercial manufacturing operations of Maryland of most importance, both to the colony and in their influence on the inauguration of national activities along these lines, may be mentioned the manufacture of flour, pig iron and finished iron products, textiles, the refining of copper, and the building of ships.

During the 19th century the manufacturing





*The Sparrows Point plant of the Bethlehem Steel Company is the largest tidewater steel plant in the world where more than 20,000 men are employed in the production of steel plate, sheet steel, tin plate, wire, pipe and countless other steel mill commodities as well as shipbuilding and repairing.*

industry of Maryland continued to expand and many new types of enterprises were established. Seafood and vegetable canning, sugar refining, fertilizer, and petroleum refining were among the larger industries organized during this era. The great steel plant at Sparrows Point also had its beginning during this period. The clothing industry assumed nation-wide importance in the late 1860's, while the grinding of grain remained a leading industry, as it had been for more than a hundred years. Many divisions of manufacture, now vital to the State's economic life, gained a strong foothold during the 1880's and 1890's.

The growth of Maryland industry from 1900 to 1914 was gradual, but the outbreak of the World War offered an opportunity for a great expansion to the manufacturing interests of Baltimore and Maryland. Rapidly Baltimore and its environs increased in importance among the great industrial centers of the United States. Other sections of the State also added materially to their manufacturing operations. The industrial expansion that resulted from the war gave a new stimulus to the industry and prompted the establishment of new lines of manufacturing which has continued ever since.

Unlike many of the Southern States, Maryland's industrial structure has not been erected chiefly to utilize local raw materials. Although a number of Maryland manufacturers, particularly some of those situated in the country districts, still are dependent upon near-by raw materials, the heavy concentration of large basic and secondary industries in the Baltimore area has resulted primarily from the city's superior transportation advantages

for assembling many kinds of domestic and imported raw materials.

By virtue of its central position on the Atlantic seaboard, near the head of navigation on Chesapeake Bay, Baltimore is closer to the great industrial centers and rich agricultural lands of the Middle West than any other Atlantic Coast or Gulf port. Baltimore's location near the large population centers of the East also affords an easy access to the greatest markets in the country for many kinds of manufactured articles.

The city lies within the zone of major trade routes between the United States and the densely populated countries of western Europe. Proximity to these and other important avenues of commerce, with short-line rail connections to the interior of the United States, has enabled Baltimore, through its great natural harbor, to become the third seaport of the country in volume of waterborne traffic. Furthermore, Baltimore's favorable situation permits the shipment of all classes of freight in the coastwise and intercoastal trades at minimum transportation costs.

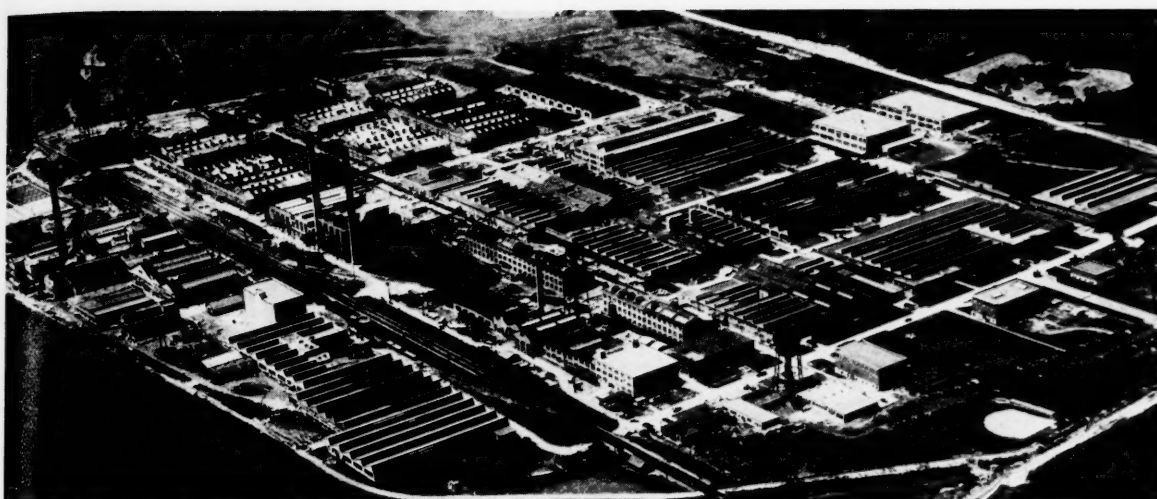
Among the advantages which Baltimore enjoys on account of its excellent geographical position is the location there of many large enterprises which require waterside factory sites and low-cost water transportation. A long list of nationally known concerns operate

extensive facilities along Baltimore's deep waterfront.

The especially advantageous natural conditions that have favored the industrial development of Baltimore have attracted to the community plants manufacturing a wide variety of producers' and consumers' goods. The broad diversification of Maryland's industrial structure is due mainly to the varied character of the industries located in the Baltimore area.

There are represented in Maryland, according to the U. S. Census, 222 distinct lines of manufacture, comprising nearly-two-thirds of the 351 separate classifications for the whole United States. Practically all types of staple products, such as many kinds of food-stuffs, clothing, shoes, hats, furniture, house furnishings, and other consumers' goods are manufactured in Maryland. In addition to these, the State produces a large number of basic and specialized products, such as iron and steel products; machinery; electrical apparatus; scientific instruments; refined copper, and other metals and alloys and their products; chemicals and pharmaceuticals; tinplate and tinware; fertilizers; rayon; paints and varnishes; cement; refined petroleum; silverware; aircraft; glass; paper and paper products; malt and distilled beverages; printing and publishing; foundry and machine-shop products; and shipbuilding and repairing.

The unusual advantages of the Baltimore Industrial Area (Baltimore City and Baltimore County) as a site for manufacturing plants has resulted in the location there of over two-thirds of Maryland's 2,683 manufacturing establishments. Notwithstanding this fact, there were, in 1937, 848 factories of



*The extent of Maryland's diversified manufacturing, with products valued in excess of one billion dollars annually, is well illustrated by these three plants: top—the Cumberland plant of the Celanese Corporation where more than 10,000 people are employed in the manufacture of rayon; center—the huge plant of the American Sugar Refining Company at Baltimore; and bottom—the Baltimore plant of the Western Electric Company, manufacturers of telephone, telegraph and television cables.*



various kinds scattered throughout other parts of the State, giving employment to 43,000 persons and distributing \$39,000,000 in wages and salaries.

Baltimore, which is now the seventh city in the United States on the basis of total population, is the largest city in the entire South and Southwest. Its retail trading territory, which extends somewhat beyond the community's seventy-nine square miles of land area has a population of more than one million persons.

The site of some of the largest industrial operations of their kind in existence, Baltimore has long been one of the nation's leading manufacturing centers. Unlike most waterfront towns in Maryland, Baltimore did not come into being in 1729 solely to meet the demand for a convenient port for the shipment of tobacco, but also to serve the growing needs of those industrial enterprises which had already been established within what are now its corporate limits. These included a grain mill, an iron forge, an iron furnace (the second to be erected in Maryland), and the mining of iron ore by both the local furnace and the Principio Company, whose Cecil County plant was America's initial great iron works.

Although enjoying a fairly continuous industrial expansion through the years since 1729, it was not until the early part of the World War that Baltimore's manufacturing

*The American Smelting and Refining Company plant at Baltimore is one of the country's largest refiners of copper and copper products, having been established many years ago when Maryland was a prominent copper producing state.*

operations began to move forward at a rapid pace. The abnormally large demand for materials of all kinds that resulted from belligerent activities abroad, gave to the manufacturing industry of Baltimore that stimulus to a larger production which placed the city in the group of the country's largest industrial centers.

During the period from 1914 to 1937 the volume of manufacturing activity in the Baltimore area, as measured by the value of manufactured products, has more than trebled. In that same period the aggregate wages paid to workers in manufacturing occupations has also more than trebled, while the number of wage earners employed increased approximately one-third. The industrial progress of Baltimore has outstripped the growth of the nation as a whole, its lead being especially

*The Wm. Schludberg-T. J. Kurdle Company plant in Baltimore is the largest meat packing establishment in a state where this industry occupies an important place.*



pronounced with respect to the value of products.

The development of the city's industry since 1914 has come largely through the establishment of new industries which chose this city because of its fundamental manufacturing advantages. However, many of the principal industries already located there have in recent years substantially increased the scope of their operations. The wealth of the community during the past twenty-five years also has been tremendously augmented through the investment of several hundred million dollars in the construction of new factories and in the expansion of existing plant facilities.

The outstanding feature of the new industries acquired during the post-war period is their unusually high diversification, a factor of vital importance to the continued progress of any industrial city. Baltimore is unique among the leading manufacturing centers in that it has a well-balanced industrial structure without any single line occupying a dominant position. As an outcome of growth along many different lines, business conditions in Baltimore are comparatively more stable than in any other large industrial city in America. In times of prosperity Baltimore sometimes follows rather than leads, but in periods of economic stress, its business volume is usually maintained at relatively high levels.

In or near the city are located the world's largest copper refinery, bi-chromate factory, sulphuric acid plant, industrial alcohol works, tin decorating plant, and spice and extract factory. One of the largest single airplane construction units and the largest producers of bottle closures and paint brushes are also located there while the huge steel plant, the largest on tidewater, has an annual ingot capacity of 3,000,000 tons, and gives employment to approximately 23,000 workers.

Industries in which Baltimore produces a substantial portion of the national output are, to mention a few, vegetable canning, fertilizers, men's clothing and furnishing goods, aircraft, bottle sealing devices, ether, titanium dioxide, tin containers, and refined copper.

Besides its industrial and shipping activities Baltimore is the principal banking center in the country south of Philadelphia and east of the Mississippi river, and is a recognized leader in the field of casualty insurance and bonding. The city occupies a prominent place, likewise, in the fields of wholesale and retail distribution.

There is considerable variation in the type of the products manufactured in the several counties of Maryland. To some extent this is due to the fact that in certain parts of the State industries have been established to utilize some mineral, forest or agricultural product that is found in the region in which an industry may be located.

The excellent fire clays of Allegany County, for example, form the basis of a large refractory industry. The cement mills of Carroll and Washington Counties rely on the local deposits of limestone for their raw materials, while the seafood plants on the





*One of Baltimore and Maryland's largest industries is that of refining petroleum. Pictured here is the Standard Oil Company refinery located on the banks of the Baltimore harbor with excellent shipping facilities.*

Eastern Shore and in Southern Maryland obtain their production requirements chiefly from Chesapeake Bay and tributary waters. Sawmills, box factories, canning establishments, and paper mills represent still other industries that depend more or less upon near-by sources of raw materials.

In some cases the development of manufacturing in the counties has been stimulated by the local demand for a wide range of consumer's goods, such as flour, bread, dairy products, ice, meats, newspapers and other articles.

The extent to which conditions in the smaller communities of Maryland satisfy the peculiar needs of individual industries is illustrated by the fact that many well-known concerns making rayon, hosiery, paper, leather and rubber footwear, automobile tires, linoleum base, clothing, and shirts operate plants in Maryland which are located outside of the Baltimore Industrial Area.

The principal manufacturing centers of Maryland, excepting the Baltimore Industrial Area, are Cumberland, Hagerstown, Frederick, Salisbury, Cambridge, and Westminster. Lying about thirty miles to the northwest, Westminster is the nearest of these places to Baltimore. The aggregate value of the annual factory production for the six cities mentioned is about one-half the value for the whole State exclusive of Baltimore City and Baltimore County.

Cumberland, with a population of more than 40,000 is Maryland's second largest city. It is located at the eastern edge of the Georges Creek coal field, famous for its high grade semi-bituminous coal. The principal industries in the Cumberland district include a huge rayon plant, employing more than 10,000

persons, and a large automobile-tire factory. Other leading products made there are steel shafting, bricks, glassware, malt and carbonated beverages, tinplate, and sole leather. Cumberland is also important for the repairing of railroad cars and equipment.

Hagerstown, the third largest city in Maryland, is located in the heart of the historic Cumberland Valley, and is midway between the eastern and western extremities of the State. It is the center of a prosperous farming region and its commerce and industries are well diversified. The principal products manufactured in Hagerstown include pipe organs, refrigerators and cold-storage doors, blast-cleaning and dust-collecting equipment, furniture, shoes and leggings, nurses' and maids' uniforms, aircraft, silk ribbons, hosiery and other knit goods. The repairing of steam-railroad equipment is also a leading Hagerstown industry.

Frederick, Maryland's fourth largest city, is situated in the center of one of the richest agricultural counties in the United States. Its manufacturing industries, while not large, are highly diversified. Among their products are brushes, stokers, pumps, ash handling machinery, clothing, hosiery, hardware specialties, canned vegetables, lime, feeds, flour, and fertilizers.

Located at the head of navigation on the Wicomico river, Salisbury, a thriving com-

munity of 13,000 people, is the second largest port in the State. Its principal industries are vegetable canning, men's and boys' shirts, and lumber and millwork.

Cambridge, one of the oldest cities in Maryland, is the center of a large vegetable-canning industry. A substantial portion of the State's annual production of canned tomatoes, tomato juice, and vegetable soups are packed there. Dorchester County, of which Cambridge is the seat of government, has the most extensive manufacturing industry of any county on Maryland's Eastern Shore.

Although located in the heart of a prosperous dairy and general farming region, Westminster, a town of 4,700 persons, has recently developed into an important manufacturing section. Men's clothing, women's shoes, meats, and distilled beverages are listed among the principal articles produced there.

The State of Maryland offers unexcelled opportunities for the production and distribution of many lines of manufactured goods. Except for those industries requiring local raw materials which are not available in Maryland, practically every kind of manufacturing activity could be carried on in the State.

Maryland's proximity to over half the country's population, residing east of the Mississippi river and north of the Ohio and Potomac rivers, places it within easy reach of the major industrial and consumer markets of the country. Moreover, Baltimore is favorably located for the receipt by water of raw materials for its factories and for the shipment of finished products by water to foreign inter-coastal, and coastwise points.

# Maryland—

## A Strategic Location Presenting an Opportunity for Industry

**T**HE Old Line State of Maryland, one of the Original Thirteen, received its first charter in 1632. Although the charter was granted upon the application of George Calvert, first Lord Baltimore, he died before its issuance and consequently the charter was made to his son, Cecil. Strange to relate, Cecil never visited the colony of which he was the real founder. Instead, he sent his brother, Leonard, who from 1634-47 fulfilled the duties of first governor of Maryland.

Ranking 41 in size with a total area of 12,300 square miles the state's land area comprises only 9,870 square miles, the remaining 2,430 being water area. In population, however, Maryland ranks 28 with 1,679,000 according to the 1937 estimated census figures. The population density is approximately 170 to the square mile.

### Climate

**T**HE year-round climate of Maryland is considered to be one of the best in the country. While summers are warm, they are usually tempered by cool intervals, and winters are mild, zero temperatures being recorded only 21 times in 64 years at Baltimore. The average annual precipitation is 41.30 inches ranging from 4.56 inches in August to 2.44 inches in November. The average annual temperature of 54° Fah. ranges from 34° Fah. in January and February to 73° Fah. in August.

### Transportation

**M**ARYLAND'S transportation facilities comprise one of the state's most valuable assets.

The State Roads System includes 4,121 miles of hard surfaced highways while the County Roads System of 11,000 miles includes 2,889 miles hard surfaced and 2,848 miles treated with stone, gravel, slag or shell.

The railroads, which cover the State with approximately 1,500 miles of main lines, provide direct transportation to virtually every part of the United States. This ensures rapid and constant communication with all markets and sources of raw materials in the South and elsewhere. The modern railroad-operated deep-water terminals at Baltimore facilitate freight handling at that port, from which there is regular steamship service to all coastal areas of the United States and, in normal times, to all foreign countries.

An outstanding transportation advantage is Baltimore's favorable freight rate structure as compared with other eastern cities, on both foreign and domestic traffic, particularly to and from the Midwest. On traffic moving through the port, Baltimore enjoys rate differentials of 1 to 8 cents per 100 pounds under the northern ports. On domestic shipments, those of local origin or delivery, the freight rates are generally on a distance basis and are even more favorable to Baltimore, ranging up to more than 20 cents per 100 pounds under New York, for example, at various midwestern points.

Baltimore's port facilities represent an investment exceeding \$150,000,000; it was the second American port during the calendar year of 1938 in imports and fourth in total foreign tonnage. For many years Baltimore has ranked first among the Atlantic and Gulf ports in the volume of intercoastal commerce

moving westward through the Panama Canal, and second in intercoastal tonnage. The total waterborne commerce during 1938 aggregated 20,451,730 tons valued at \$660,411,769.

According to the Baltimore Association of Commerce, Baltimore harbor has about 40 miles of deep water frontage with total berthing space for all types of vessels at piers operated by the railroads amounting to almost 48,000 lineal feet; covered pier space 2,158,231 square feet; open pier space 488,157 square feet; 10,400 railway cars can be accommodated on the storage tracks and the waterfront warehouse space operated by the railroads is over 1,340,000 square feet. In order that additional facilities may be provided, the State legislature has empowered the City of Baltimore to expend \$50,000,000 for the construction of new piers, warehouses and other necessary equipment.

At the present time there are 53 steamship lines using the port of Baltimore, operating 59 services in the overseas, inter-coastal and coastwise trades.

The Chesapeake and Delaware Ship Canal was recently improved to accommodate deep-draft vessels. It has a navigable depth of 27 feet and a bottom project width of 250 feet. The completed canal provides a new trade route for deep-draft vessels and brings Baltimore 24 hours closer to North Atlantic and European ports.

Through-water-and-rail service at low rates is available to and from virtually every point throughout the South making this region's vast source of raw materials easily obtainable for industrial purposes.

### Manufactures and Finance

**O**NE of the leading industrial states in the entire South, Maryland's manufactured products in 1937 were valued at \$1,095,862,972, representing an increase of \$354,254,991, or approximately 48 percent more than the 1935 value of \$741,607,981. The broad diversification of Maryland's industrial structure is shown partly by the fact that its 2,683 manufacturing establishments fall into more than 200 separate industry classifications. Food and kindred products with an output valued at \$240,418,768 is the most important single division of manufactures, accounting for 21.9 percent of the value of the state's entire industrial output in 1937. Iron and steel with their products, but excluding machinery, in the amount of \$209,951,048 ranked second with 19.2 percent; machinery and transportation equipment (air, land and water) totaling \$161,024,506, was third with 14.7 percent; and non-ferrous metals and their products and products of coal, petroleum and rubber amounting to \$151,879,716 was fourth with 13.9 percent.

Of the 101 types of industries shown separately in the 1937 census reports, the value of products of 61 types, each having a value exceeding one million dollars, mens' and boys' clothing occupied first place with \$50,300,206. Other outstanding manufactures included: meat packing, \$40,611,524; canned and bottled fruits, vegetable juices, etc., \$30,881,579; printing and publishing, \$27,027,984; bread and bakery products, \$26,566,579; fertilizers, \$21,229,302; malt and distilled liquors, \$21,113,825; machinery and machine shop products, \$20,832,052; shipbuilding and repairing, \$17,925,710; chemicals, \$14,589,254; paper, \$12,718,727; paints and varnishes, \$11,530,585; women's and children's clothing, \$10,669,226; and non-ferrous metals and their products, \$10,483,878. Other individual indus-

tries not separately listed by the census whose annual production is valued at ten million dollars or more are: blast-furnace and rolling mill products; copper refining and copper products; tin can and other metal containers; sugar refining; petroleum refining; stamped and enameled ware; aircraft; electrical machinery and apparatus; and rayon.

The cost of materials, containers, fuel and purchased electric energy used in Maryland industries during 1937 totaled \$665,027,358, while the 145,932 wage earners in the state's 2,683 establishments had a payroll aggregating \$156,995,227.

In 1939 the state's 190 banks reporting to the Comptroller of the Currency had a capital stock, including capital notes and debentures, of \$37,231,000 and aggregate resources of \$1,003,744,000. Individual deposits amounted to \$894,197,000 while the total bank transactions of four reporting clearing house exchanges was \$3,544,529,000.

## Agriculture

**ALTHOUGH** Maryland is one of the smaller states of the Union with a large industrial development, agriculture occupies a prominent place in the economic set up. In 1939 the cash farm income amounted to \$67,905,000. From the 1,652,000 crop acres, crops yielded a cash income of \$29,351,000, while livestock and livestock products produced \$36,351,000. Among crops, truck crops were the largest single income producer with \$7,819,000 of which \$6,843,000 was derived from truck crops for canning or manufacture. Tobacco came second with 29,796,000 pounds yielding \$5,499,000 and wheat third with 7,352,000 bushels yielding \$4,237,000. Other important crops are corn and fruits. Dairy products yielded a cash farm income of \$27,195,000 made up of \$18,305,000 from milk, \$4,752,000 from eggs and \$4,138,000 from chickens.

## Fisheries

**THE** coast line of Maryland bordering on the Atlantic Ocean is 31 miles. The tidal shore line, however, is nearly 3,000 miles. This latter fact, together with the large area of protected and shallow waters, makes almost ideal commercial fishing conditions.

The value of fishery production, though not as great as manufacturing and agriculture, nevertheless constitutes an important factor in the life of the state and provides employment to thousands of persons. In the five years, 1934 to 1938, the value of all finfish was \$2,000,000 while the value of shell fish in the same period exceeded \$8,745,000. Of the latter sum, oysters contributed \$5,898,000 and crabs \$2,799,000. Among finfish, shad, striped bass, alewives, croaker and squetegues comprise the largest value. Though state law forbids fishing for menhaden with purse or buck nets within state waters, quantities of this fish are found in abundance in outside waters.

The most important fish, shell or fin, at the present time both from a commercial and by-product viewpoint is the oyster. Maryland's oyster production averages more than 4,000,000 standard bushels annually. Large as this is, the extent of its potential productivity can be gauged from the fact that the state's charted natural oyster bars embrace a total area of approximately 265,000 acres.

## Timber

**THE** present forest area of Maryland, comprising approximately 2,230,500 acres, bears an estimated volume of saw timber equivalent to 3,878,454,000 board feet; of this amount 2,547,793,000 board feet are hardwoods and 1,330,661,000 board feet are softwoods.

The total lumber sawed in 1938, the latest year for which figures are available, was 23,421,000 board feet, including 23,421,000 board feet of softwood and 13,270,000 board feet of hardwood.

There are 157 trees indigenous to the state including nearly all the important timber trees of the east.

In 1936 there were 61 establishments engaged in the timber industry the value of whose products was \$929,821; the value of materials and power used therein amounted to \$365,528 while the payroll totaled \$226,985.

## Minerals

**ON** the accompanying map are shown those minerals, which at present are being commercially produced even though the quantity in certain instances may be small. In these days of mineral utilization and chemical conversion, it is not possible to state precisely what constitutes commercial quantity or

economical production; a certain deposit may be useless on the basis of production alone, yet that same deposit may conceivably be the deciding factor in the location of an industry requiring just what is available. For this latter reason it has been deemed wise to mention the following minerals with such additional information as may be pertinent. Of those minerals now being produced, additional deposits in other counties are known in several instances.

Chromite in Baltimore and Harford counties and its presence in Carroll, Cecil and Montgomery counties was responsible for the establishment of this industry in Baltimore, but it is now found more economical to import the raw material.

Diatomaceous earth is available in Anne Arundel and Prince George counties, though commercial utilization has not been found very practicable.

Copper ores occur in several counties and have been mined in the past in Baltimore, Carroll and Frederick counties.

Brown iron ore was at one time mined and refined in Allegany, Baltimore, Carroll, Caroline, Frederick, Harford, Washington and Worcester counties.

Dolomite, gabbro, gneiss and magnetite have all been mined in Baltimore county. Hematite, zinc and lead ores all occur in Carroll county.

Ocher has been obtained from Anne Arundel, Frederick, Prince George counties while marl has been extracted from nine different counties.

## Electric Power

**THERE** are 30 power plants in Maryland with a total generating capacity of 657,644 kilowatts. This latter is made up of three hydroelectric plants with a capacity of 271,385 kilowatts, fourteen steam power plants with 378,982 kilowatts capacity, and thirteen internal combustion engine plants with 7,277 kilowatts capacity.

Production of electricity in 1939 was 2,144,405,000 kilowatt hours including 1,029,148,000 kilowatt hours and 1,115,257,000 kilowatt hours produced by water power and fuels respectively.

## Taxation

**WHEN** machinery and equipment used in manufacturing are exempt from taxation by local authority, they are also exempt from state taxes. But the exemption from local taxes of raw materials and manufactured products in the hands of manufacturers, as in Baltimore City, does not carry state tax exemption. The state tax, however, is quite small.

The corporation franchise tax on domestic corporations ranges from a minimum of \$10 for corporations with capital stock of \$5,000 or less to an additional \$50, on each million dollars up to ten million dollars. Beyond that sum the tax is at the rate of \$100 for each five million dollars. Foreign corporations are assessed upon the basis of the amount of capital employed within the state, the rate being \$25 for every \$50,000 up to \$500,000; between \$500,000 and \$5,000,000 an additional amount equal to one-fortieth of one percent on the excess; over \$5,000,000, an additional sum of \$30 for every million dollars of such last named excess.

The Maryland state corporation income tax of one and one-half percent, with deductions similar to those of the Federal government, is the lowest of all states levying an income tax. There are no general sales taxes and there is no intangible personal property tax anywhere in the state.

Owing to particular local conditions contingent upon contiguity with the metropolises of Baltimore and Washington, county tax rates vary considerably, the range being from 84 cents low to a high of \$3.11 in one small district: the average is less than \$2. The assessed value of all taxable property in 1938 was approximately \$3,091,120,265.

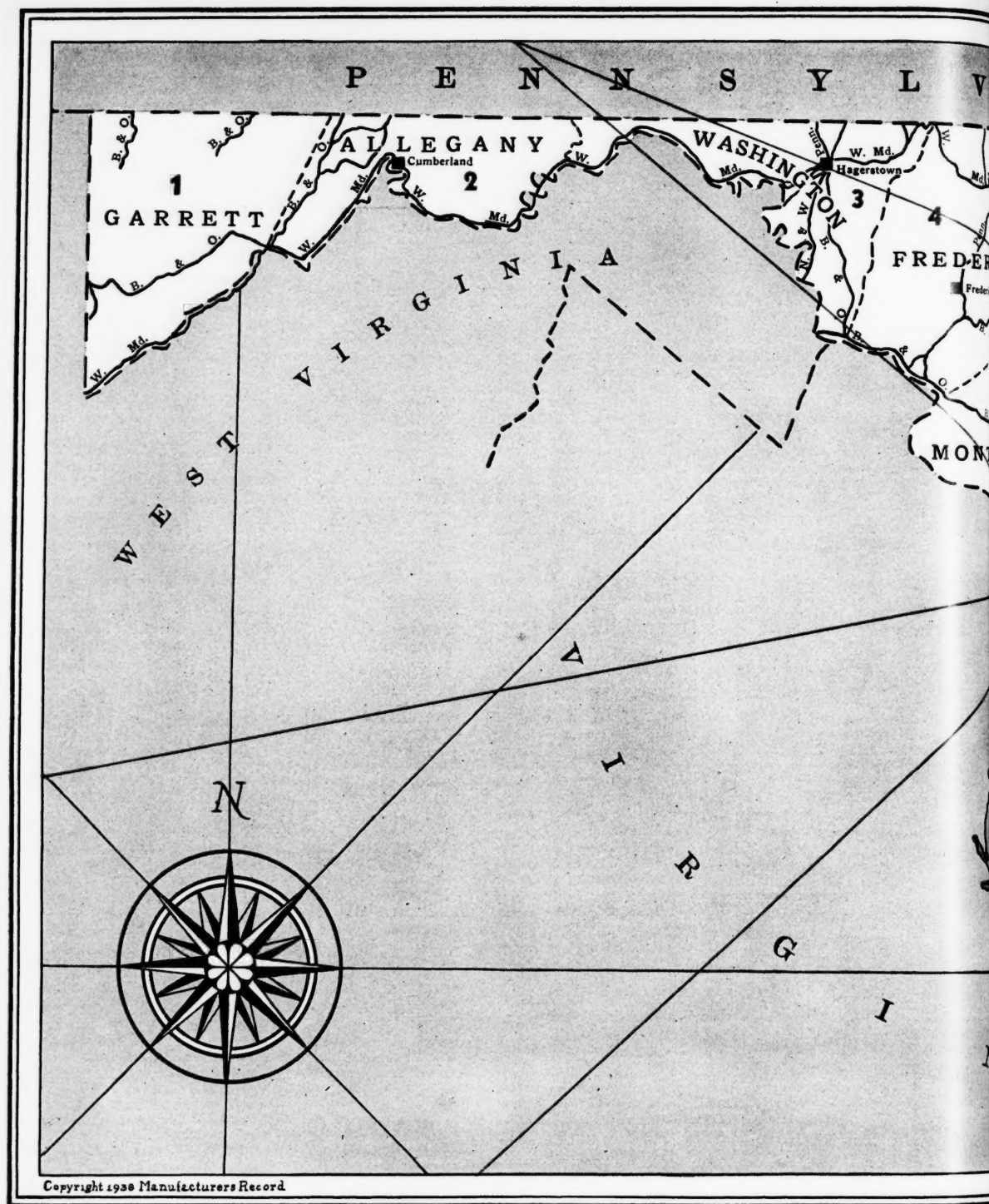
## Labor and Wages

**THE** great diversity of employment conditions in manufacturing in Maryland makes it impossible to arrive at any useful conclusion regarding average wage rates or even a range of wage rates. There is however, because of Maryland's location in relation to populous centers, usually an abundance of labor of all kinds.

The labor situation is exceptionally satisfactory due in part to the high percentage of home-owning wage earners. In 1930, 61.7 percent of Baltimore city's dwellings were owned by their occupants. Almost eighty percent of Maryland's white population is of native American parentage. Seven percent is foreign born and thirteen percent foreign stock.

Maryland and especially its metropolis are notable for unusual educational, recreational, medical, and cultural advantages.





# MARYLAND

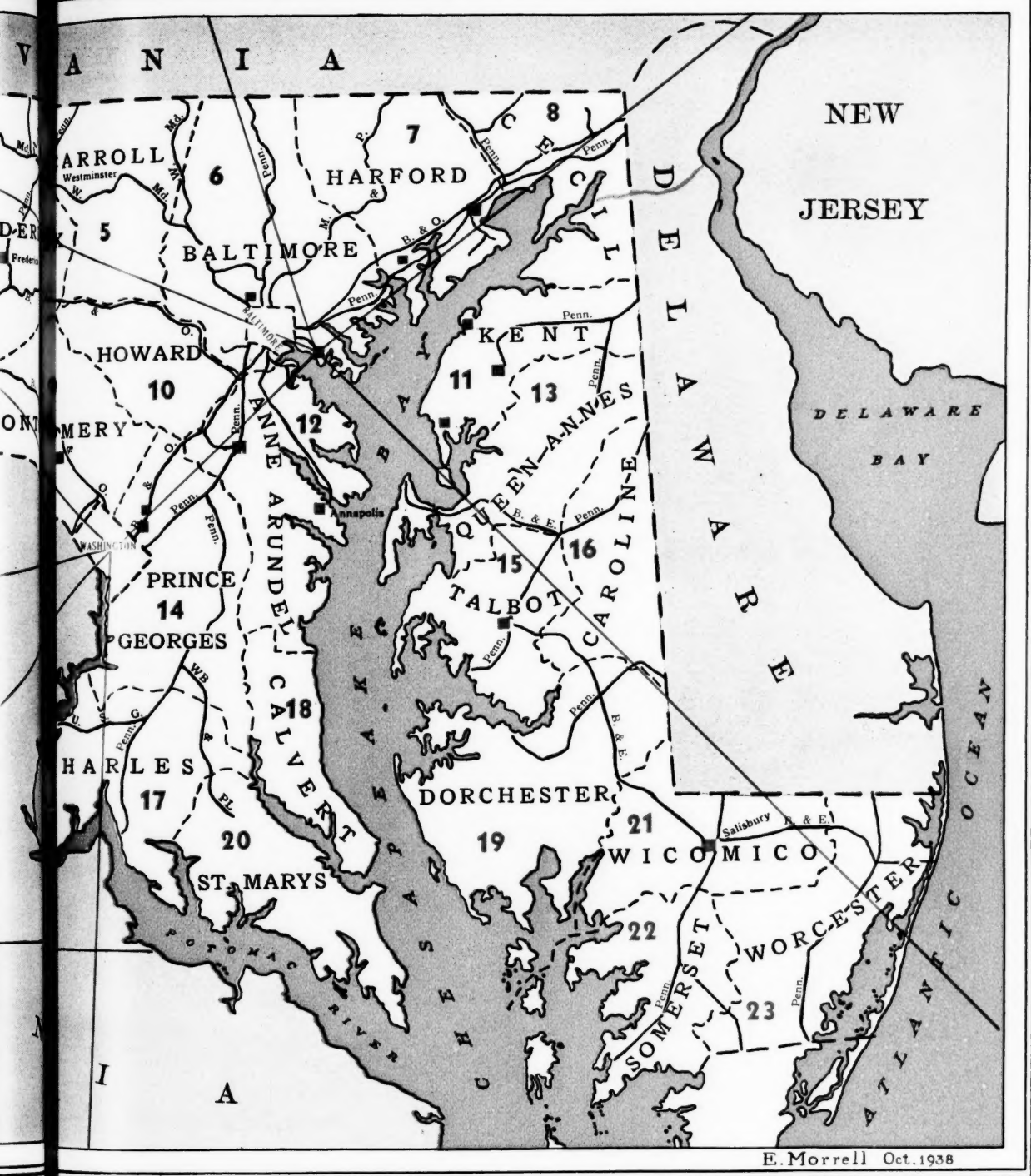
Its principal raw materials and transportation facilities offering opportunities for industry, with additional facts on the reverse side pertaining to industry and its growth within the state.

**Minerals—Counties in which material is commercially produced**

Asbestos—7

Basalt—6, 7  
Clay—2, 6, 12, 14  
Coal—1, 2  
Coke—6  
Feldspar—5, 8, 10  
Gold—4, 9  
Granite—6, 8, 9  
Gravel—2, 6, 8, 10, 12, 14  
Lime—2, 3, 4, 5, 6  
Limestone—1, 2, 3, 4, 6  
Marble—6, 7  
Quartz—7, 10  
Sand—2, 6, 8, 10, 12, 14  
Sandstone—1, 2, 3, 5, 6, 10

Slate  
Soap  
Fish  
Agriculture  
Corn  
Soybeans  
Sweet  
Tobacco  
Timber  
Hare



Slate—7

Soapstone & talc—7, 10

Fisheries—6, 7, 8, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23

#### Agricultural products

Corn—all counties

Soybeans—7 to 9, 12, 15, 16, 19, 21 to 23

Sweet potatoes—3 to 6, 9, 11 to 23

Tobacco—1, 5, 7, 9, 10, 12, 11, 17, 18, 20

#### Timber

Hardwood and pine—1, 2, 3, 6, 9, 12 to 23

Mixed hardwoods—all counties

Pine—1, 2, 9, 10, 12 to 23

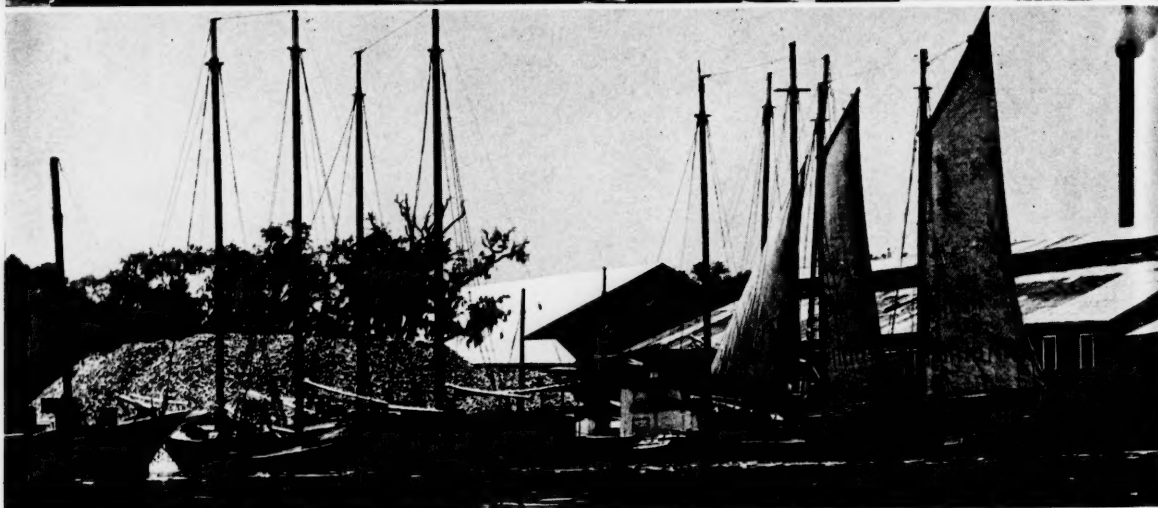
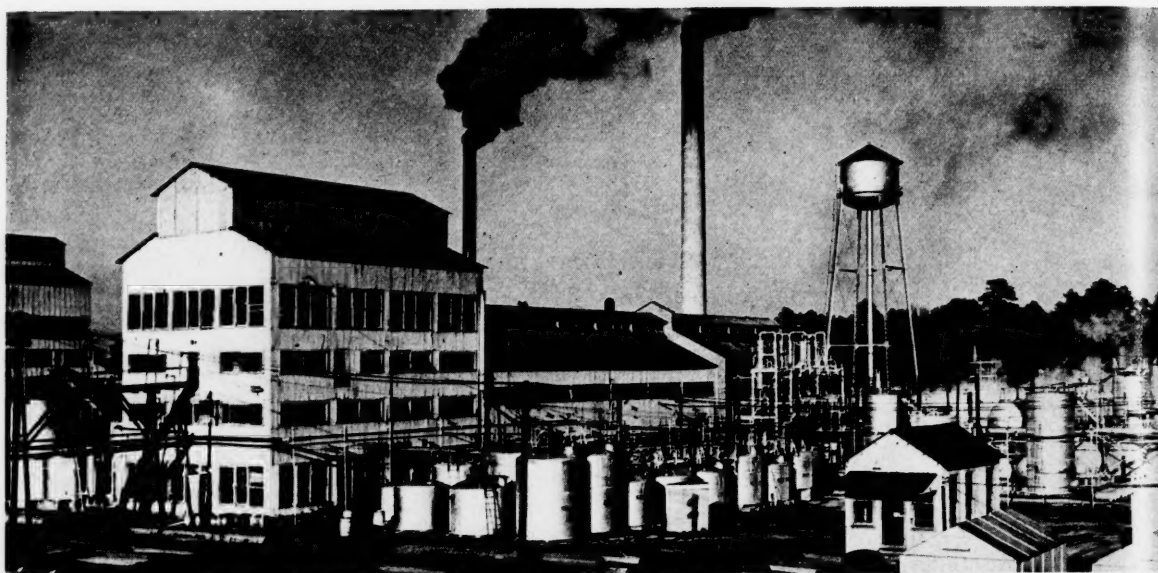
Natural gas is available for consumption in—1, 2

————— Railroads

————— Navigable waterways

————— Airlines

■ Airports—also at principal cities printed in red



Top—The distillation plant of the Hercules Powder Company at Hattiesburg, where southern pine stumps are fractionally distilled for turpentine, rosin and numerous other naval stores products; this industry, by using otherwise useless pine stumps, has bought a new source of cash income to farmers. Center—Oyster boats anchored alongside one of the many packing plants which line the shore of Biloxi's Back Bay; the huge heaps of shell which accumulate are in turn used in other industries. Bottom—The Borden plant at Macon, Mississippi, is one of the South's largest creameries and condenseries; it is located in the "Black Prairie" grazing section in a county which produces more than 3,000,000 gallons of milk annually.



# MISSISSIPPI



*Spouting from this small choke is the first oil brought-in in Mississippi's and the nation's newest major oil field, the Tinsley field near Yazoo City in west-central Mississippi. Nearly thirty producing wells have been brought in since this first well struck oil in September 1939.*

## MISSISSIPPI—HEART OF THE SOUTH

BY

Thomas Garner James \*

THAT astute reviewer of the ante-bellum South, J. P. B. Debow, once remarked that New York's Erie Canal in effect made the Mississippi River flow uphill. Yet it is probable that not even he foresaw the full dependence of the nation's manufacturing sites on lines of transport.

The rise of factory industry in the United States has been paralleled by the rise in importance of transportation. No factory production is free from this element. Factory sites are determined by comparative advantages in bringing together raw materials and shipping out finished products.

It is for this reason that the South hails the recent establishment of the principle of sectional "parity" in freight rates on manufactured articles as the entering wedge of the most important drive toward industrialization the section has yet seen.

In no other Southern state does transportation assume a more significant or more representative role in industry than in Mississippi. Geographic center of the South, this state epitomizes the South's "industrial frontier" status. The change in the South's transportation structure foreshadowed by the rate parity victory should have its first and most noticeable effects in Mississippi.

\*Until recently Mr. James was Assistant Director of the Mississippi Advertising Commission at Jackson, Miss.

Little explanation is needed to support the foregoing statement. Mississippi's present rate structure is the accompaniment of an economy characterized as a plantation, colonial, extractive type. Mississippi more than any other Southern state is committed to raw material production and shipment to out-of-state processors. The adoption of a new scale of rates favorable to within-the-state processing of Mississippi's raw materials is bound to be a tremendous incentive to the establishment of manufactories in its bounds.

A recitation of the transport advantages attracting Mississippi's newest industrial acquisition is an illustrative case. The Flintkote Corporation, manufacturers of a fibre wall-board, plan to begin production in 1941 from their \$2,000,000 Meridian, Mississippi, branch plant now under construction.

Meridian, Mississippi's second largest city

with a 1940 population estimated at 40,000, is served by no less than seven railroad lines. The city's location itself is the result of the crossing of two of the South's earliest railroads in the 1850's. Meridian's history has been that of a rail center; Sherman began his "march to the sea" at the Meridian railhead; ever since the War the city has drawn timber to its sawmills and wholesaled its goods to crossroads retailers through virtue of its rail facilities.

These same rail facilities, now supplemented with five paved highways, will bring pulpwood from a million acres of East Mississippi pine into the mill yard. And the same rail facilities, with Meridian's strategic location, puts the branch plant in a preferred position to market its product regionally.

Another example of the influence of transportation in locating a factory within Mississippi is the state's first tire plant, one of the Armstrong Tire and Rubber Company's units, opened in the summer of 1939 at Natchez. Close to areas producing the nation's finest long-staple cottons, the plant has both water and rail facilities for the importation of rubber; and the same water and rail, as well as paved highway, routes make for easy distribution to Southern market outlets in competition with Akron producers.

These two new plants, one processing Mississippi timber, the other Mississippi cotton, are representative of the state's developing industrial economy, underlying basis for which is the state's strategic location with regard to Southern raw materials and Southern markets.

To show just how strategic this location is, note Mississippi's position in the states which as members of the Southern Governors Conference have joined in the fight for freight rate parity. These eleven states, from North

Carolina to Oklahoma and down to Florida and Texas form a belt which Mississippi almost bisects longitudinally.

Of the 79,527,000 acres in 41 principal crops in this Southern belt outside of Mississippi, 30,968,000 lie to the east of the state, 48,559,000 to the west. To the \$1,288,938,200 value of the major crops in this Southern belt outside of Mississippi, the eastern states contribute \$682,861,400; the western states \$606,076,800. The six states lying east of Mississippi had a farm cash income in 1937 of \$724,725,000; the four states lying west \$598,775,000. The eastern Southern states produce an average of 4,289,700 bales of cotton and 1,903,600 tons of seed; the western 6,641,500 and 2,997,200. On other agricultural raw materials for chemurgic industrial processing they divide as follows: Sweetpotatoes, eastern South 35,257,000 bushels; western South 16,826,800. Sugar cane syrup, eastern South 9,465,900 gallons; western South 7,125,400. Tung, eastern South 22,125 acres; western South 16,000. Value of truck crops, eastern South \$34,744,000; western South, \$18,057,000. Value of livestock and poultry, eastern South \$430,350,000; western South \$595,173,000.

In forest area the six states east of Mississippi in 1930 totaled 114,824,000 acres; the four western states 56,825,000. In average lumber production the six eastern states totaled 4,680,261,300 board feet; the four western states 3,548,641,300.

So much for the annual production of industrial raw material from Southern farms

*Mississippi's largest single industrial plant, parent plant of the Masonite Corporation at Laurel, manufactures fiber board from pine chips. The company is now experimenting semi-commercially with the nation's first ligno-cellulose plastic product made from the same pine raw material.*

and forests available to centrally located processing plants. The population markets are almost equally divided: 14,548,562 people in the six states east of Mississippi; 12,177,830 in the four states west.

To these impressive figures Mississippi adds its own: 5,999,000 acres in major crops, with the average of annual crops valued at \$107,350,800. A farm cash income of \$130,150,000. Average production of 1,462,100 bales of cotton and 649,600 tons of seed. 6,638,500 bushels of sweetpotatoes; 3,377,300 gallons of sugar cane syrup; 65,000 acres of tung orchards; \$2,434,000 average commercial truck crop value; and \$76,099,000 in livestock and poultry.

In forest area Mississippi has 18,293,000 acres, with an average lumber production of 1,629,252,400 board feet—greatest in the South.

Mississippi's 1930 population was 2,009,821.

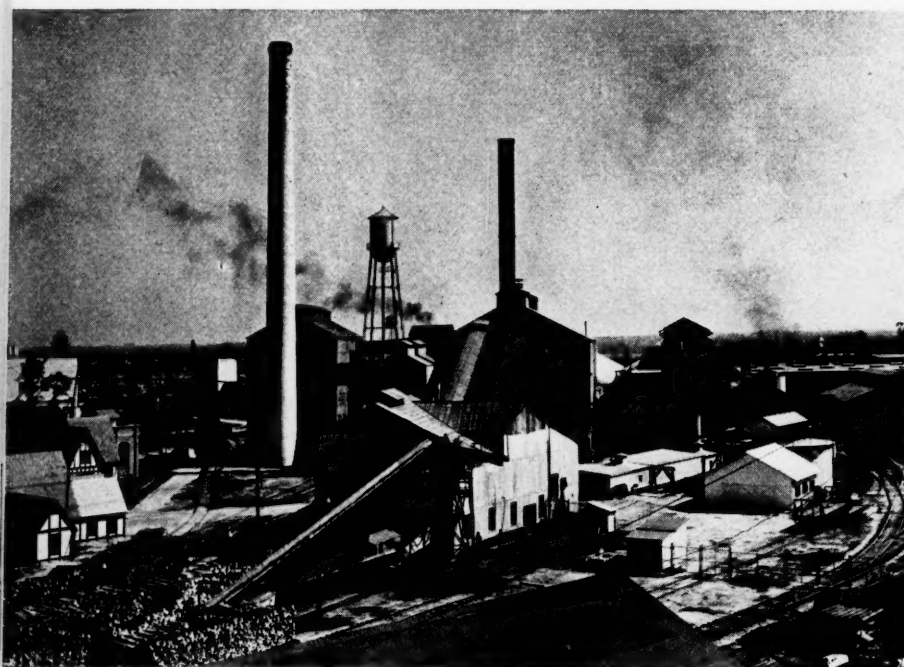
These are the resources in annually replenished raw materials and markets which plants centrally located in Mississippi will find opened to them as a result of the freight rate victory.

In regard to other raw materials and operating factors the location and transport advantages of Mississippi are equally as compelling.

An industrial survey of the state explains: "Centering the South's farm production and forest belts, centering the Southern market, Mississippi is also fortunately situated in the center of producing areas of Southern minerals which act as catalysts in the chemical transformation of raw materials.

"Located midway between the coal and iron fields of the southeastern states and the oil and gas fields of the southwestern states, and being readily available to the mineralized areas of the southeastern and mid-continent regions, Mississippi is in an ideal situation for the coordinated use of a great variety of mineral products from all parts of the South. Of especial importance is the proximity to both types of mineral fuels, the coal of the southeast and the oil and gas of the southwest.

"Mississippi is unsurpassed in the variety and quality of her undeveloped clay resources. With the opening of the Tinsley field in west-central Mississippi, the state is now looked upon by petroleum geologists as the next great oil producing area. The expected

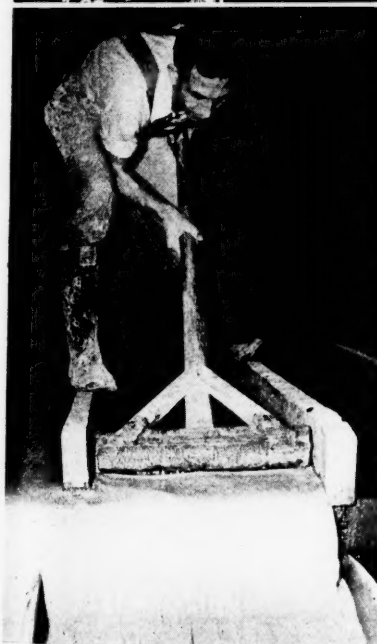
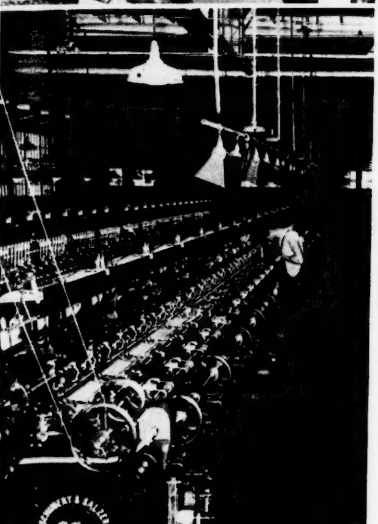


**The BILOXI-GULFPORT**  
(Miss.)  
**DAILY HERALD**

carried more display advertising in May than in any month since June 1930, indicative of the growth of the Mississippi Coast territory.



*Top—The Armstrong Tire and Rubber Company's plant at Natchez reached its quota of 2,500 tires a day six months after its first unskilled workers were introduced to making tires. Center—Skilled technicians assembling the batteries of knitting machines in the Julius Kayser hosiery plant at Hattiesburg. Bottom—This worker in the nation's only sweetpotato starch plant at Laurel is scraping gummy, liquid starch from settling troughs onto conveyor belts which will carry it to powerful drying machines.*



development of these two mineral resources will assist in the rapid industrialization of the state and stimulate the local processing of agricultural and forest raw materials."

A half dozen major companies operate more than 4,000 miles of railroad trackage in Mississippi. In the Illinois Central system the state has the Mississippi valley's greatest trunk-line carrier, serving the entire western half of the state and connecting with Mississippi's deep water harbor at Gulfport. A formidable new company takes over the eastern margin of the state in the merger of the Gulf, Mobile, and Northern, and Mobile and Ohio roads.

The nation's largest inland waterway, the Mississippi River, carries Federal and private barge traffic from half a continent along the western border of the state.

With the second largest system of secondary roads in the nation, Mississippi has been well known for its excellent farm-to-market roadways. In 1936 Mississippi authorized its first major highway construction program to pave nearly 3,000 miles of trunk-line routes; the \$100,000,000 program is giving the state a surfaced system comparable to the best.

Serving an evenly distributed, largely rural population, Mississippi's motor freight lines are extending their operations.

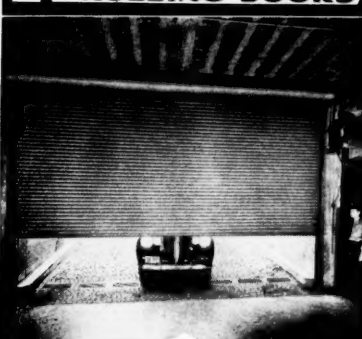
Mississippi's two public utility companies operate a combined total of 5,265 miles of distribution and transmission electric power lines in the state. While Mississippi has no hydro-electric power production facilities of its own, high lines from Louisiana, Arkansas, Tennessee, and Alabama tie into the gridwork; and some of the South's largest steam generating stations also contribute current.

The Tennessee Valley Authority has pioneered in distribution of its hydro-electric power to northeast Mississippi communities since 1934.

Quantity rates on natural gas in those Mississippi communities where pipe lines penetrate are unusually low. Many of the pipe lines parallel electric power lines, with all principal cities being served by both.

But Mississippi is "heart of the South" in more than location and transport. Most "Southern" of states, Mississippi represents and nearly epitomizes the South in climate, physiography, soils, and natural vegetation. Mississippi's profile is the South in profile, from Tennessee river hills to piney woods, river plain, and sea coast. What is possible to the South is possible to Mississippi, heart of the South.

## KINNEAR ROLLING DOORS



### EFFICIENT FROM THE GROUND UP

**Coils above lintel — saves space!**

**Opens out of reach of damage!**

**Raises over snow, ice, obstacles!**

**Can't bind, warp, sag or pull apart!**

**Repels fire; defies intrusion, weather!**

**Slats can be individually replaced!**

**Designed to fit the opening — easy to install!**

You know you're going to get money-saving door efficiency when you install Kinnear Rolling Doors. They've been tried and proved in the world's best testing grounds—in actual use, under some of industry's most gruelling conditions—for more than forty years! And talk about durability! Rugged steel slats formed into an all-steel curtain and anchored in rigid steel jamb guides, make Kinnear Rolling Doors almost wearproof! They're built for any doorway, for motor or manual control. Let us send you complete details. Write today!

**The KINNEAR**  
MANUFACTURING COMPANY  
1600-20 FIELDS AVENUE  
COLUMBUS OHIO  
Agents in Principal Cities



# Mississippi—

## Its Variety of Resources Offer Opportunities for Industry

**M**ISSISSIPPI, popularly known as the Magnolia State, originally constituted a part of Louisiana and was first settled by the French in 1699. In that year Iberville established a colony at a site which he named Biloxi and is now across the bay from the present city of that name. In 1763 Mississippi was ceded to Great Britain and admitted to statehood in the Union on December 10, 1817.

With a total area of 46,875 square miles, of which 503 square miles comprise water area, Mississippi ranks 31 in size. In population, the state ranked 23 with an estimated total of 2,017,000 in 1937. According to the 1930 census, the population density was 43.4. Mississippi is unique in that the whites are still outnumbered by the colored race who comprise 50.2 percent of the total. However, it is anticipated that the 1940 will show the white population to be in the majority. The white foreign born comprise only 0.7 percent of the total whites.

### Climate

**T**HE climate of Mississippi conforms closely to that of the surrounding states and is temperate and equable. The average annual temperature varies from 61° Fah. in the extreme northern part of the state to approximately 68° Fah. on the coast, the difference in summer months however is negligible. The frost free season averages over 200 days each year in the north and about 275 days in the southern section. The average annual precipitation is 52 inches.

### Transportation

**M**ISSISSIPPI is generously supplied with transportation facilities by rail, road, water and air. With approximately 4,000 miles of railroads, everyone of the state's counties are traversed with rails connecting all the principal cities as well as providing rapid and direct communication with virtually all points outside the state by the six major railroads and other smaller companies.

The entire mileage of highways within the state is now close to 65,000 miles, of which the state system comprises nearly 8,000 miles. Of the latter, over 3,000 miles are paved and more than 5,250 miles are graded and drained. Extensive passenger and freight bus lines complement the other modes of transport.

Extending for the entire length of the state's western boundary is the country's largest inland waterway, the river Mississippi. This river, carrying both federal and private barge traffic, with freight terminals at Natchez, Vicksburg and Greenville, offers great opportunities for freight transportation to northern markets as well as a convenient link with ocean shipment. In addition to the Mississippi, several other rivers already are navigable and the navigability of others is projected or in course of completion. Gulfport on the Gulf coast is the state's principal deep water port with adequate modern facilities for handling the wide variety of commodities entering and leaving the terminal. The ten mile ship channel to the open Gulf has a depth of 26 feet thus permitting usage by the majority of ocean going vessels. Nearby Biloxi and Pascagoula also offer shipping facilities particularly for coastwise traffic.

Air lines, operating the length and breadth of the state and connecting the principal Gulf ports, provide additional passenger and freight transportation, while 32 airports and fields are strategically located throughout the state.

### Manufactures and Finance

**T**HE value of manufactured products in Mississippi amounted to \$190,670,510 in 1937, a gain of \$70,340,509, or approximately 58 percent over the 1935 figure of \$120,330,001. Of this amount, cottonseed products ranked first with \$42,576,010 and lumber and timber products came second with \$35,507,143. Other important manufactures are cotton textiles and clothing, and a variety of industries following the farm chemurgic program.

In the 1,100 establishments located in the state there were 46,040 wage earners employed in 1937 with a total payroll of \$26,383,931. The cost of materials, containers, fuel, and purchased electric energy was \$114,445,825.

During the year 1938 the total taxable volume of retail sales as reported by 19,264 taxpayers was \$241,570,926. Service activities such as warehouses, gins, hotels, etc. reported a total volume of \$15,765,437. Manufacturing enterprises totaling 1,197 reported a total sales volume of \$139,351,503. Of the manufacturers, those processing lumber and timber products accounted for a volume of \$53,277,012. Cottonseed oil and fertilizer factories did a volume of \$28,594,168. Cotton mills and garment factories produced goods to a total taxable value of \$17,929,056.

The wholesale industry included 541 taxpayers who reported a dollar volume of \$112,100,240. Railroads and public utilities numbering 100 reported and paid a tax on intrastate business totaling \$21,296,590.

The total internal revenue collections for 1939 amounted to \$5,947,353 of which \$2,882,204 represented income tax.

The aggregate resources of the state's 205 banks which reported to the Comptroller of the Currency in 1939 totaled \$220,050,000. Capital stock of these banks, including capital notes and debentures, comprised \$16,293,000 while savings deposits amounted to \$64,889,000.

### Agriculture

**M**ISSISSIPPI is essentially an agricultural state, both from the point of view of employment as well as source of income. Furthermore, the diversity and variety of agricultural products are becoming increasingly important because of their adaptation to industrial use. In 1939, the cash farm income was \$168,823,000, \$102,196,000 from crops and \$32,297,000 from livestock and livestock products.

Cotton comprises the principal crop and is grown on a major scale in almost every county except those bordering the Gulf coast. From the 2,525,000 acres of cotton harvested in 1939, was obtained 1,585,000 bales of lint yielding a cash income of \$76,589,000, while 705,000 tons of cottonseed yielded an additional \$12,282,000. Other important crops from an industrial point of view which are being developed are corn, sweet potatoes, sugar cane, peanuts and soy beans. One of the most interesting and promising developments is tung trees. Many thousands of acres have now been planted in the southern part of the state and a nut crushing mill has been erected in the heart of the region.

Livestock numbering 3,009,000 are valued at \$85,856,000 including 1,273,000 cattle worth \$29,162,000.

The dairying industry is growing rapidly as evidenced by the fact that the first milk condensery and the first cheese factory

in the South are stated to have been located in Mississippi within recent years. Cash farm income from dairy produce in 1939 totaled \$15,375,000 of which milk contributed \$10,208,000, eggs \$3,056,000 and chickens \$2,111,000.

Although Mississippi has only a small coast line, it borders the Gulf, from which is derived the majority of the nation's shrimp as well as a considerable quantity of oysters and other fish. In the three Mississippi counties on this coast is centered the major part of the entire Gulf's seafood industry.

## Timber

OF all the state's resources, it is probable that Mississippi forests are the most valuable.

Of Mississippi's 29,672,000 acre land area, forest land covers 15,875,000 acres of which 15,860,000 acres is described as commercial forest land.

The total saw timber area consists of 8,325,000 acres or 1,885,000 acres old growth and 6,440,000 acres second growth. Otherwise expressed, softwoods claim 16,910,000,000 board feet (3,160,000,000 board feet old growth and 13,750,000,000 board feet second growth) and 19,025,000,000 board feet are hardwoods (6,800,000,000 board feet old growth and 12,225,000,000 board feet second growth), making a total of 35,935,000,000 board feet supply of saw timber. With such a predominance of softwood timber, Mississippi is ideally situated for the development of the pulp and paper industry.

An indication as to the character of Mississippi timber may be obtained from the U. S. Southern Forest Survey's estimates of the total growing stock volume expressed in cords by specie groups. There are 57 million cords of pine, 43 million cords of soft-textured hardwoods including cypress, and 49 million cords of firm-textured hardwoods, a total of 149 million cords. Of the total, 58 million cords are in trees below sawlog size.

The northeast portion of Mississippi is characterized by both the upland hardwood type and the shortleaf-loblolly pine-hardwood type. On the west, the Mississippi River delta is in the bottomland hardwood type. The central portion is predominantly the loblolly-pine-hardwood type and to the south is found the longleaf-slash pine type.

The total number sawed in 1938, amounting to 1,189,692,000 board feet, included 912,624,000 board feet of softwoods and 277,068,000 board feet of hardwoods.

In 1937 there were 355 establishments engaged in the lumber industry, the value of whose products was \$35,507,143. The cost of materials and power used in production amounted to \$15,829,639 and \$9,320,863 was expended for wages.

Though not a major industry, naval stores are produced in several counties as indicated on the accompanying map and give employment to a considerable number of people besides supplying the basis of other industries.

## Mining and Minerals

ON the accompanying map is indicated those minerals which are at present being commercially produced in Mississippi. This, however, does not present an adequate picture of the state's mineralogical possibilities because, except for certain clays and aggregates, Mississippi's mineral resources have not yet been worked. The fact that most of the deposits are non-metallic may possibly account for the delay in production.

During the past year oil was discovered in the Tinsley field of Yazoo county and at least 11 wells are now producing. While extensive search is being made for oil in many parts of the state, Tinsley is the only proven commercial field.

In addition to the clays now produced there are other enormous deposits of different varieties and excellent quality in several parts of the state. Surveys have already been completed in a number of counties and others are scheduled for prosecution in the near future. It is claimed that almost every county has clays suitable for brick and tile making while white clays are available in abundance in several counties suitable for stoneware, face brick, electrical fixtures, and also as fillers for paper and paint.

Other minerals with known deposits of a size and quality fully adequate for commercial production are limestone, marls, bauxite, tripoli, lignite, gaultite, and salt. Still other minerals believed to exist in commercial quantities and warranting further exploration are ochre, Fuller's earth, novaculite, building stone, silica, amber, asphalt, gypsum, chert, and coppers.

It is reported by geologists that in view of the abundance of Mississippi's mineral resources, the output should be twenty times as much as the present annual average.

One of the most valuable discoveries made in the state during recent years is the availability of natural gas. This has been developed at two fields since 1930 so that at present the average daily capacity is in excess of three billion cubic feet. Pipe

lines from these and Louisiana fields supply gas to a large number of Mississippi's counties.

The Mississippi sales tax law taxes the extraction of natural resources, but excludes that part of the extraction manufactured in Mississippi plants. Natural gas and oil, however, are taxed for the entire production. The taxable volume of natural resources produced was \$2,332,516.

## Electric Power

ALTHOUGH Mississippi has no hydroelectric power generating facilities of its own, interstate connections with Alabama, Arkansas, and Tennessee provide a means of augmenting the states' own facilities and assure an ample supply at minimum rates.

The 62 Mississippi plants have a totaled installed generating capacity of 67,127 kilowatts. This is made up by 21 steam power plants having a capacity of 49,077 kilowatts, and 41 internal combustion engine plants with a capacity of 14,558 kilowatts.

Production of electric power by public and private plants in 1939 totaled 67,127,000 kilowatt hours, all produced by fuel operated plants.

## Taxation

IN 1936 Mississippi enacted legislation providing for county and municipal exemption from all ad valorem taxation, except that of a state character, for virtually all kinds of new factories and new enterprises, for a period of five years from the date of charter in the case of a corporation or commencement of operations in the case of an individual enterprise. In the same year under the "Balance Agriculture with Industry" act, new factories and enterprises were offered exemption on physical property from all ad valorem taxation including state ad valorem taxes. The state property tax was fixed at a maximum of six mills for 1938 and 1939 but it may be reduced by executive proclamation if the condition of finances so warrant.

Entrance fees for recording charters are \$20 for the first \$5,000 of capital stock and \$2 for each additional \$1,000 up to a maximum of \$500,000. In no instance may the fee exceed \$500.

The state income tax applicable to corporations having a gross income over \$5,000 per year or net income in excess of the statutory exemption of \$1,000, is graduated from 3 percent on the first \$2,000, 4 percent on the next \$3,000, 5½ percent on the next \$10,000 and 6½ percent on the remainder.

The corporation franchise tax is at the rate of \$1 per \$1,000 of value of capital stock, surplus, undivided profits, and reserves employed within the state. The minimum tax is \$10.

Mississippi also has sales taxes which vary on different commodities.

The assessed value of all taxable property within the state in 1939 was \$549,897,346.

## Labor and Wages

MISSISSIPPI'S population is one of the most evenly distributed of any state in the Union. The average density per square mile of 43.4 persons varies among counties from a high in Hinds of 99 persons to a low in Perry of 12.7.

There are no large areas in the State uninhabited; and with few exceptions there are no areas densely urban.

The population is largely rural, with the percentage of urban dwellers increasing steadily but at a slower rate than that for the United States as a whole. In 1930 the urban population was 21.1%. Only 11.8% live in cities of 10,000 or more. Only 16.9% live in towns of 2,500 or more.

The extent to which urban labor may be available for industry is mirrored to some extent by the trend of population toward the larger cities and towns. Mississippi's largest city, Jackson, increased its population 130% between 1920 and 1933. Gulfport registered an increase of 50.1%, Hattiesburg 46.9%, Laurel 44.2%, Biloxi 41.7%, Meridian 36.7%, McComb 33.7%, Vicksburg 31.6%, and Greenville 28.8%. According to preliminary estimates of the 1940 census, the population increase between 1930 and 1940 of Jackson was 28.3%.

Mississippi industry does and will employ a large percentage of rural people. In one typical case 75% of the workers are from the country and only 25% from the city in which the plant is located.

The general low cost of production is shown by the figures of the 1930 census. It was 1.5% less in Mississippi than in any of the bordering states, and 1.6% less than the United States average; notwithstanding that part of the cost of production being paid as wages was almost 3% better in Mississippi than the United States average.

# MISSISSIPPI

Its principal raw materials and transportation facilities offering opportunities for industry, with additional facts on the reverse side pertaining to industry and its growth within the state.

**Mineral Counties in which material is commercially produced**

Bentonite—9, 17, 56

Clay—2, 5, 9, 12, 15, 16, 17, 19, 23, 33, 37, 38, 48, 52, 62, 74, 82

Natural gas—23, 48, 49

Paint pigment—3

Petroleum—12

Sand and gravel—6, 23, 27, 33, 62

Sandstone—6

**Agricultural products**

Corn—all counties

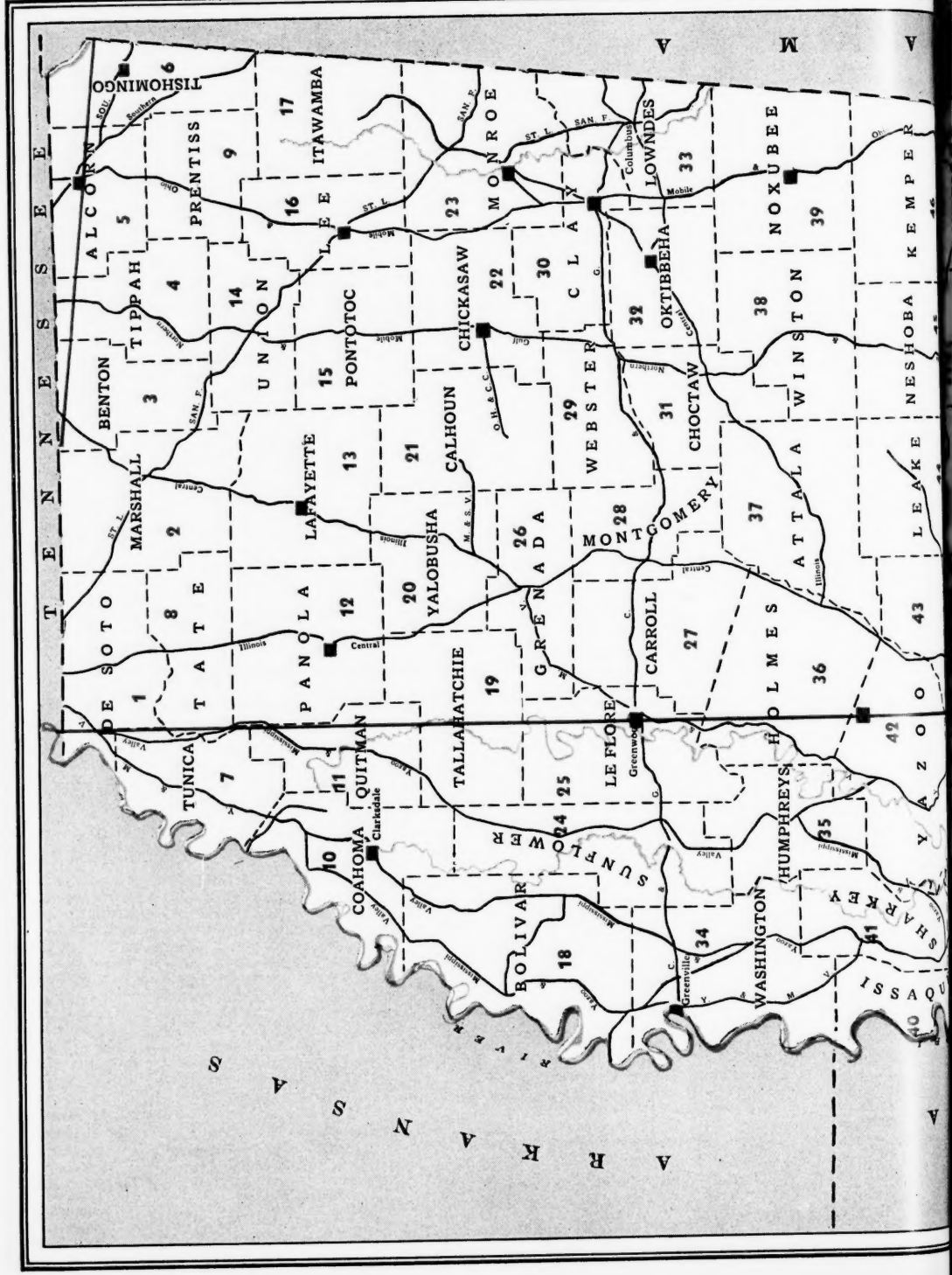
Cotton—1-74, 79

Oranges—77, 80, 81

Peanuts—1-9, 11-34, 36-40, 42-46, 47-59, 61-67, 69-73

Soybeans—5, 9, 10, 16, 21, 24, 25, 27, 34, 42, 51

Tung oil—70, 74, 77-79, 81, 82

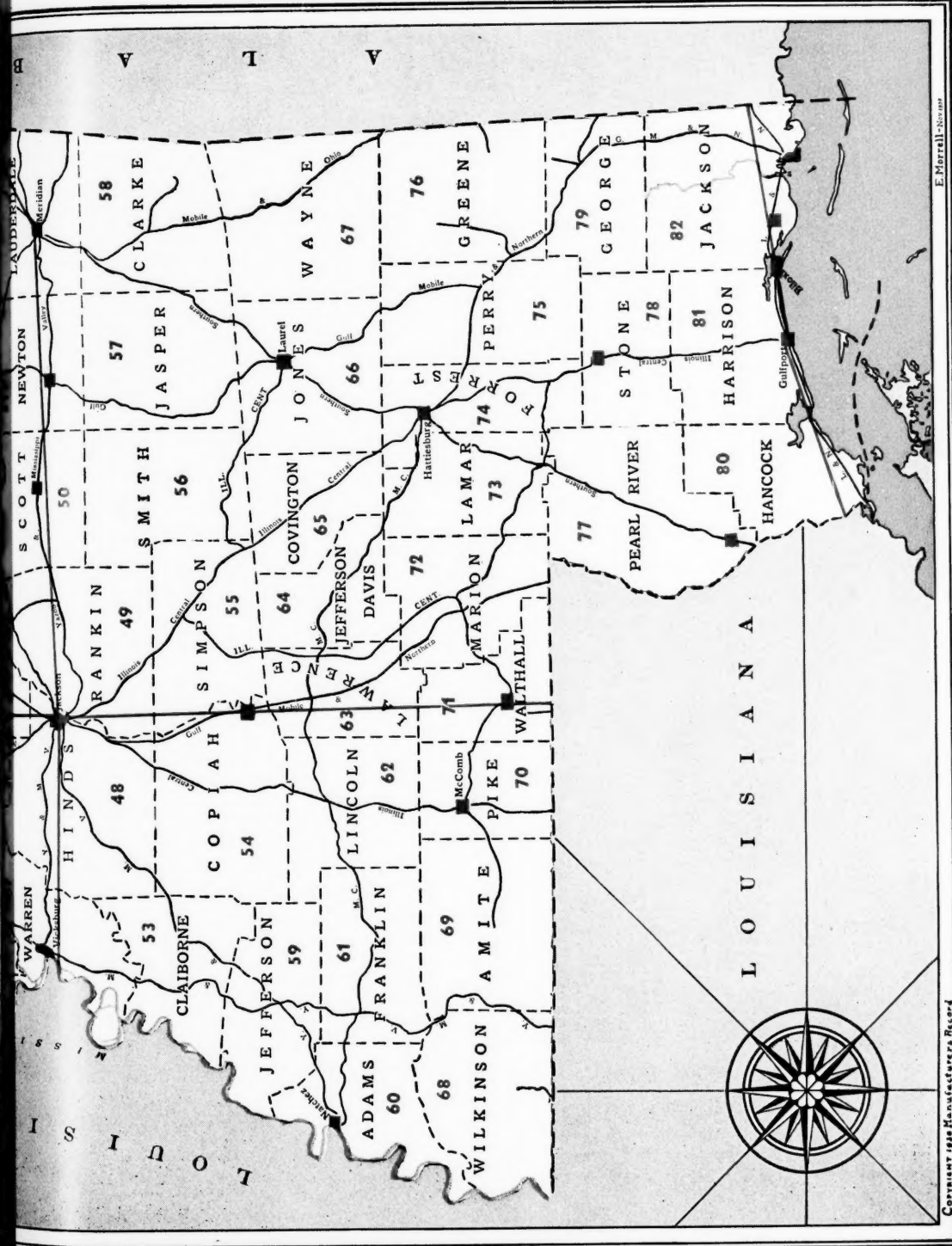




Soybeans—5, 9, 10, 16, 21, 24, 25, 27, 34, 42, 51

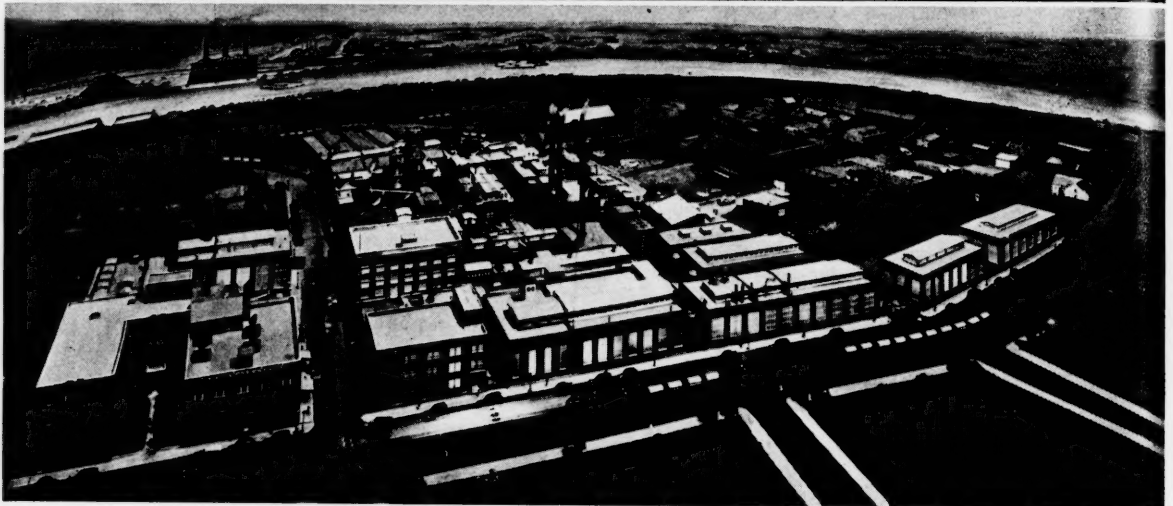
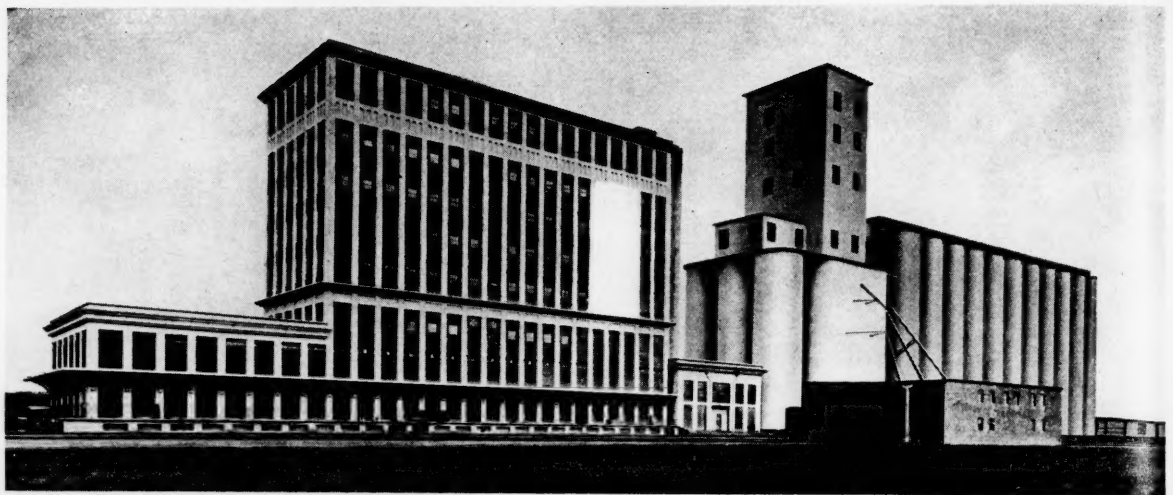
Y A Z O O 43 LEAKE NESHOBA KEMPER

WARREN



Copyright 1938 Manufacturers Record

- Tung oil**—70, 74, 77-79, 81, 82
- Fisheries**—30, 31, 32
- Timber**
- Longleaf-slack**—64-67, 70-82
- Shortleaf-hardwoods**—4-6, 9, 17, 23
- Shortleaf-loblolly-hardwoods**—3, 4, 13-15, 17, 19-23, 26-33, 36-39, 43-46, 48-70
- Loblolly-hardwoods**—68-70
- Mixed upland hardwoods**—1-5, 8, 9, 12-16, 19, 20, 22, 27, 30, 36, 42, 43, 47, 48, 53, 59, 60, 68
- Mixed bottomland hardwoods**—23, 68, 72, 79, 82
- Oaks-mixed hardwoods**—10, 12, 18, 19, 24, 35
- Redgum-mixed hardwoods**—1, 7, 10, 11, 18, 19, 24, 25, 27, 34-36, 40-42, 47, 59, 60, 68
- Naval stores**—66, 67, 72, 74, 76 to 82
- Natural gas is available for consumption in the following counties:—1, 7, 10, 16, 18, 23-25, 30, 32-34, 36-43, 46-49, 52, 54-56, 60, 62, 65, 66, 68, 70, 72-76, 78, 79, 81
- Railroads
- Navigable waters
- Airlines
- Airports—also at principal cities printed in red



*Top—The Kansas Flour Mill at Kansas City is one of the largest mills in a large flour producing state. Center—A dioramic view of the Monsanto Chemical Company's Plant A at St. Louis; this company is not only the largest chemical concern in Missouri but one of the largest in the South. Bottom—In a state whose largest industry is meat packing it is not surprising to find that the Joplin plant of the Mecker Company, Inc., is the nation's largest manufacturer of steerhide leather products.*

# MISSOURI



*A part of the cattle pens in Kansas City stock yards. Meat packing is the largest industry in Missouri in the annual value of its products which in 1937 amounted to more than \$116,575,000.*

## ECONOMIC FORCES IN THE DEVELOPMENT OF MISSOURI

BY

Dr. I. Lippincott

*Washington University, St. Louis, Mo.*

PRACTICALLY all the commonly enumerated factors of localization have been at work in the economic development of Missouri. Dominance was sometimes in one group, sometimes in another. At the beginning, two physical resources supplied the first incentive to settlement and to the application of business enterprise.

When in 1719 the mineralogist De Lochon sent home lead ore which had been obtained on the Meramec, a westward tributary of the Mississippi, it seemed that the great expectations of mineral wealth in this territory were about to be realized. Romance, adventure, financial machinations, were all involved in the enterprise which led Philip Francois Re-

nault to explore Louisiana north from New Orleans. Map makers among the early explorers misled subsequent generations of adventurers into the belief that this country contained a great abundance not only of base, but of precious, metals. Hence, Frenchmen expected to repeat the exploits of the Spaniards in South America. One map indicated, in what is now Arkansas, an emerald of such great size that an ox-team would be required

to drag it. In these days the founders of enterprises were not guided by research, nor even by testing. They were moved by hunches. Business men, such as they were, staked their fortune on chance guesses concerning business opportunities.

Upon such a foundation the company of the West came into existence. John Law was one of the moving spirits. He saw a magnificent opportunity for speculation in the land and supposed riches of the Mississippi country. He turned attention to this region upon the formation of the company in 1717. Though we are not now concerned with the history of this organization since it passed through various cycles of wild speculation to





eventual failure, it is worth the observation that out of this grew the first exploitation of the mineral resources west of the Mississippi river; also the introduction of slavery into Louisiana.

Although methods of mining and forms of organization have changed greatly since Renault's day the industry still continues, after more than two hundred and twenty years of development, as one of the important activities of the state. Production of lead, and later of zinc, in the southwest corner of the state did not begin on an important scale until the region was opened by railways. This industry also contributed to the industrial wealth of the state. Throughout its history lead has formed the basis for both local and distant manufactures, notably of shot and white lead.

For some years this metal was the cause of an economic struggle among the towns of the interior, and became the focal point of not a little political intrigue. At one period, for example, the state of Illinois refused to charter a railroad which would have its terminus opposite St. Louis. The purpose was to direct not only the lead trade, but other types of commerce, to Alton, which, in the jargon of the day was to become the "great commercial emporium of the interior."

At this juncture two other factors of localization began to exert an influence, namely, local capital available for business ventures, and experience and skill of business men. These factors favored St. Louis as the main source of business enterprise.

Centrally located on the great system of waterways of the interior, with the Missouri, the Illinois, and Ohio focusing traffic upon it, a bulk-breaking point as between the upper and lower Mississippi, the nearest place for supply of frontier army trading posts, convenient, also, for fur traders operating in the Northwest and for the more general trade with Santa Fe, there was no other location which offered as great advantages for widespread commerce. This condition, also, militated against any considerable development of local manufactures because of the greater profit in trading ventures.

As centers of commercial activity the Missouri cities, notably St. Louis and Kansas City, were focal points for trade which spread in many directions. From the manufacturing places on the Atlantic seaboard and upper Ohio river came a considerable array of goods, some of which were consumed locally, but with larger quantities distributed in the vast area tributary to the leading Missouri marts. Herein the rivers offered the advantage,—some 20,000 miles of "coast," according to the estimates of the time. Westward, beyond

*The Eagle-Picher Lead Company plant at Joplin is the largest one of its kind in the nation's biggest lead producing state. They manufacture, mine, smelt and refine lead for all kinds of lead products.*

the reach of the streams, trade was carried by packmen, then by pack trains, and finally by wagon trains,—a condition which prevailed for some years after the opening of the first transcontinental railroad in 1869.

The fur trade, which with lead, supplied the primordial incentive for business enterprise in Missouri was the main factor in opening the Far Western commerce,—to Santa Fe and ultimately deep down into old Mexico, into the Northwest, and with the discovery of precious metals in Colorado, to the Mountain states.

In trade, as in all economic activity, it is often the unseen that counts. So it was with furs. At times the value of this commerce amounted to large sums. For the decade before 1800 it was estimated as in excess of \$200,000 a year. About 1835 the value of furs and skins shipped to New Orleans annually was estimated at \$1,000,000. But of greater contribution than these physical items of trade was an unappreciated service which the trader rendered to the cities of Missouri, namely, the opening of all the country west of the Mississippi, the revelation of its riches, the encouragement to migration and settlement. As some one has said,—"The fur trader was the farmers' path finder into some of the richest regions of the continent." The benefits accrued gradually with an enormous enhancement of the commerce that focused on these places.

In short, until some years after the close of the Civil War, advantage of location was the main cause for the development of enterprise. The main groups of items involved in this commerce were hardware, clothing, drugs, drygoods. These were brought from communities to the east, passing thence through the hands of local merchants to an ultimate destination which in some instances was Mexico, or the North Pacific, or what is now California. Typical advertisements in local papers as late as 1880 were to the effect that "So-and-So" has just "imported" from New York a line of fall goods. He respectively invites his customers to come and inspect the stock."

For many years the early settlements of Missouri were confined to the borders of its streams. If for no other reason, the need for communication with the outside world, near and far, dictated this type of existence. The inhabitants were engaged largely in subsistence farming, in the development of certain mineral lands, and so far as the towns were concerned, mainly in trade. As described by

contemporaries as late as 1840, the soil of Missouri was stated to be either very fertile or very poor, either bottom land or cliff, either prairie or barren, with very little of the intermediate variety. This description was only partly true; but, at this time, it frightened people away from areas which, under modern systems of cultivation, have become rather productive.

Comparisons of the output of farm products are impaired by the fact that the states vary greatly in size, as well as in soil and climatic conditions. With these limitations in mind it might be said that Missouri is now one of the important corn growing states, usually ranking fifth or sixth among the other commonwealths. The acreage yield is somewhat above the national average. This is true also of oats. The rank in wheat production varies usually from tenth to twelfth. The state is also an important producer of livestock,—the Missouri mule has long enjoyed the eminence which properly belongs to this faithful animal. Fruits, vegetables, dairy products add to the variety of the agricultural output.

In referring to physical resources we currently use the phrase "commercially available." This means that development is possible only under present technique, or of relative cost of extraction and delivery in consumers' markets, or comparative advantage in the investment of capital. Missouri contains a number of base metals, but under present conditions only lead and zinc enjoy exploitable advantage. At one time, the iron ore resources of the state supplied both local and distant industries. Iron Mountain and Pilot Knob, for example, were once thought to be solid masses of metallic iron. Subsequent development showed that this assumption was without foundation. Under present competitive conditions the iron ore resources of the state remain largely undeveloped. What the future has to offer remains to be seen; but growing improvement in methods of separating ore from detritus lends hope to the belief that eventually Missouri will gain some advantages from the coming developments.

Throughout most of its history the state has been the home of a considerable range of industries,—at first mainly for local use, later for the supply of an ever widening market. Due to proximity to agricultural sources of supply Missouri has long enjoyed a high rank in such enterprises as slaughtering and meat packing, in the manufacture of flour and grist mill products, and in tobacco, among others. The boot and shoe industry which made an appreciable appearance in the decade from 1870 to 1880 has the advantage of a wide market. Chemicals, brick and tile,

lumber and timber products, glass, explosives, lime, and stoves have been for many years typical manufactures of Missouri. And, of course, there is a considerable range of industries which supply metropolitan areas; the list includes bread and bakery products, printing and publishing, food preparations, confections, and the manufacture of ice. Representatives of most of the nation's leading industries exist in varying degrees of importance. In this group are the output of foundry and machine shops, car building and repairs, automobiles, clothing, refining of petroleum, electrical machinery, among various others.

With mass production as one of the typical features of the American industrial system, the localization of industry is largely influenced by available sources of raw materials, including power, and by mass markets with all that this implies. These are notable factors in the placement of manufactures of iron and steel, of machinery, including electric machinery, and of clothing and textiles. Unless conditions change radically, the home of such industries must remain chiefly in the North Atlantic region, in the upper Ohio Valley, and along the Great Lakes. Nevertheless, local enterprises in many regions, of which Missouri is an example, can pursue most of these manufactures, although not on as large a scale as in the regions just named. Missouri has the advantage of almost unlimited power resources, of many raw products of the field, and of cheap receipt of

partly finished raw materials. Upon these a long list of manufactures can thrive.

In addition, the Missouri cities have an unusual advantage in the extent of available markets. According to the Census of 1929-1930 this state ranked fifth in wholesale distribution, with about 4.85 per cent of the total for the country. It was surpassed only by New York, Illinois, Pennsylvania and California.

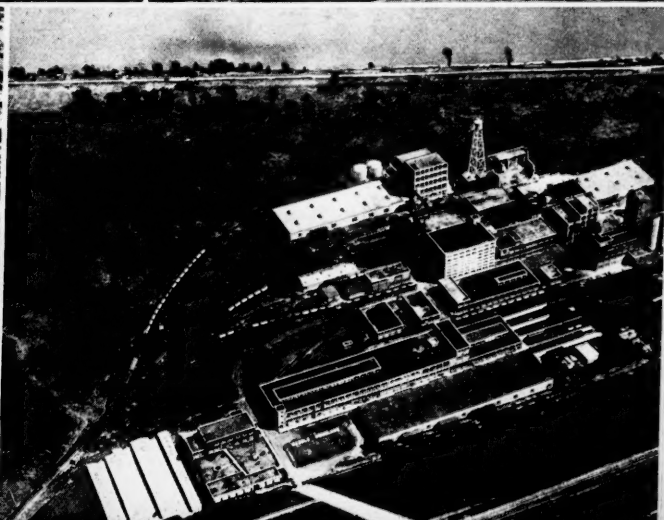
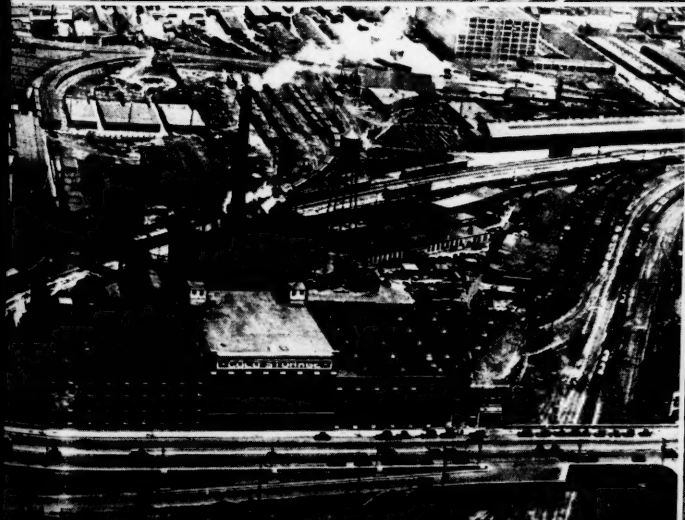
The word "market" is an elusive concept. It might be applied to particular commodities, or to goods as a group. With this in mind it can be said that wares of Missouri manufacture, of acquisition, are sold in an area described roughly as a vast triangle with the apex on St. Louis and the base extending from Florida to southern California. To be sure, goods manufactured, or acquired for sale by Missouri merchants, are sold outside

this triangle, but this dimension covers approximately the territory which draws a considerable part of its wares from the activity of Missouri enterprise.

In our discussion of industries and their location we usually overlook the human factor which is as important, perhaps more important, than physical surroundings. In many instances, business enterprise, industrial creative instinct, ability to see opportunities, and willingness to take the necessary risks account for the founding of industries where one would least expect to find them.

In view of the new application of science to manufacture, as witnessed notably in the chemical, petroleum, and metallurgical industries, an area must undergo constant survey for the purpose of testing its possibilities as a location for new manufactures. This is a job for men of business insight and initiative. This thought applies as well to Missouri as to any other location. In view of the momentous changes that are now taking place it would be a bold prophet who would urge that Missouri is, or is not, an appropriate locality in which to invest new capital either for the purpose of manufacture or commerce. The real magnet which attracts business to one locality rather than to another is often the quality of the business genius. Location, resources, capital, labor supply are not self employing. Human enterprise of some description must combine these factors and put them to work,—and we might add, keep them at work.

*Below are some of Missouri's largest plants in representative industries. Top left—the Hannibal plant of the International Shoe Company, whose headquarters are at St. Louis. Top right—the main factory building of the A. P. Green Fire Brick Company at Mexico. Bottom left—the St. Louis plant of the St. Louis Independent Packing Company, one of the state's largest meat packing concerns. Bottom right—the Corn Products Refining Company plant at Kansas City*



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As this "South's Resources" issue of the MANUFACTURERS RECORD has had a limited press run, complete copies available for purchase will soon be exhausted.

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# Missouri—

## Vast Mineral Deposits Present an Opportunity for Diversified Industries

**M**ISSOURI, popularly known as the "Ozark State" was first explored by De Soto about the time 1541-42, and was visited by Marquette in 1673. Originally settled by the French, Missouri formed part of the Louisiana Purchase and was admitted to statehood in the Union in 1821 after a bitterly fought political debate between representatives of the North and South. The bone of contention centered around the admissible entrance of a slave state which culminated in the now famous "Missouri Compromise." The present state boundaries were not established till 1836.

With a total area of 69,420 square miles of which 68,727 square miles are land area, Missouri ranks 18th in size. The population of 3,975,000 however, places this state in tenth place while the density is slightly more than 57 to the square mile. The negro population comprises only about six percent.

### Climate

**T**HE climate of Missouri, though essentially continental and characterized by a rather wide range of temperature and variation in amount of precipitation, has never been the cause of a total failure of any crop grown in the state. On the contrary the extremes of climate are not nearly so pronounced as in the more northerly states while the southeastern section is closely related to the South. The average annual temperature is about 55.3° Fah. ranging from a low average of 30.8° Fah. for the coldest months to 77.5° Fah. average in the warmest. The average snowfall is slightly above 17 inches and killing frosts seldom start before the middle of October and cease before the end of April. The average annual precipitation of 40.58 inches varies from an average 36.72 inches in the north to 43.69 in the southeast.

### Transportation

**U**SUALLY regarded as the gateway between the North and South, Missouri's ample transportation facilities lend emphasis to this reputation providing extensive service not only throughout the state but also to virtually every part of the nation.

The railroads, with a total mileage close to 8,000 miles and operated by some 25 major lines, have large terminals in both St. Louis and Kansas City where trunk lines to the Atlantic and Pacific seaboard provide constant communication for passenger and freight traffic. In addition, adequate wharfage is available at both of these cities for the river traffic passing up and down the Mississippi, Missouri and Illinois rivers to points north and to New Orleans on the Gulf Coast where ocean transport is readily obtainable.

Though railroads and navigable waterways offer extensive transportation facilities, highways have not been neglected as a medium for freight and passenger service. At the close of 1938 the state highway system had completed or under contract no less than 15,344 miles, of which approximately 7,500 miles are classified as major roads. Hard surface highways including concrete, brick and bituminous treatments cover over 6,570 miles

and granular surfaced roads add about 8,400 miles more.

Finally, air transport also provides extensive passenger facilities throughout the state and country, due in large part to the air terminals on the east and western state boundaries.

### Manufactures and Finance

**A**CCORDING to the 1937 census, the value of Missouri's manufactured products was \$1,505,383,002, representing an increase of \$321,745,934 or more than 27 percent over the 1935 amount of \$1,183,637,068. In only one of the state's 114 counties is manufacturing not conducted.

Although 103 of the 137 different industries listed separately in the census reports each manufacture products in excess of one million dollars annually, there are additional industries consisting of only one or two plants for which separate figures are not given and which, in many instances, have a larger output than many of those listed.

Of the industries shown separately, meat and poultry packing rank first with products valued at \$124,203,764. Other important industries include: boots and shoes, \$103,253,379; clothing, \$72,158,919; flour and grain mill products, \$61,597,878; printing and publishing, \$60,623,443; electrical machinery, equipment, etc., \$53,090,558; bread and bakery products, \$46,126,114; malt, rectified and blended liquors, \$34,827,199; machinery, machine tools and machine shop products, \$30,729,615; butter, \$28,730,936; paints and varnishes, \$27,768,739; prepared feeds for animals and fowls, \$26,319,964; boot and shoe findings, \$25,989,356; drugs and medicines, \$24,335,460; electric and steam railroad cars, \$23,955,112; and steel works and rolling mill products, \$21,727,059.

The cost of materials, containers, fuel and purchased electric energy used in all Missouri industries totaled \$944,984,934 in 1937. And in the state's 4,291 establishments, 186,831 employees had a payroll of \$202,585,847.

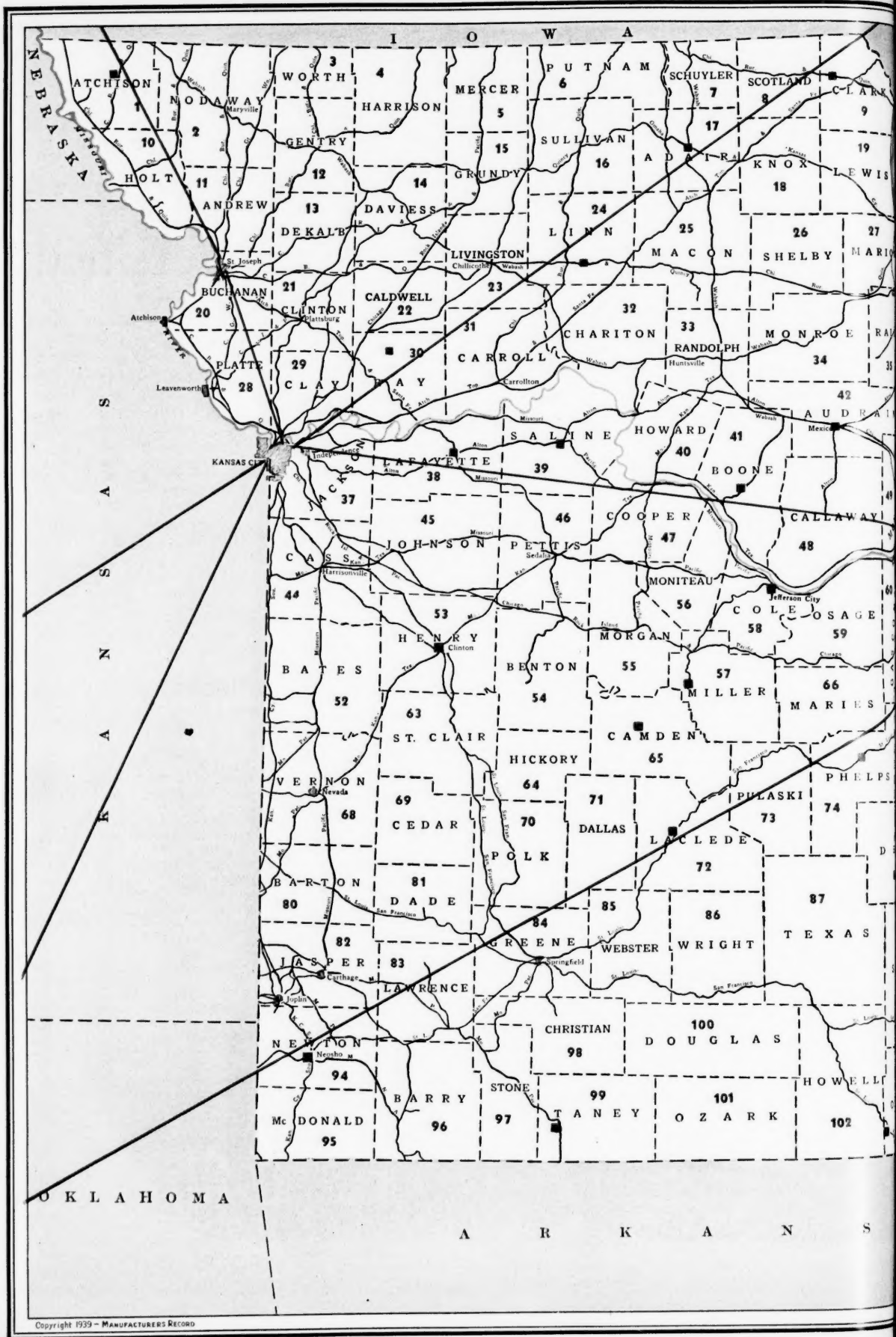
According to the Missouri State Commissioner of Labor and Industrial Inspection, the total value of manufactured goods in 1938 was \$1,412,036,498 of which \$781,702,974 was the value of goods shipped out of the state. Raw materials used in the process of manufacturing were valued at \$683,579,721. Salaries for the 240,815 employees in 4,596 reporting firms amounted to \$353,564,788. Total capital invested was \$907,932,795.

In 1939, there were 636 banks which reported to the Comptroller of the Currency and had a capital stock including capital notes and debentures of \$86,361,000. Aggregate resources totaled \$1,678,359,000 of which \$1,501,360,000 was individual deposits. Savings deposits in all banks amounted to \$293,217,000. Total bank transactions of the nine reporting clearing house exchanges was \$9,286,322,000.

### Agriculture

**I**MPORTANT as industry is in Missouri, agriculture occupies an equally important part with almost a third of the population classified as farm residents while only about a quarter

(Continued on page 168)



# MISSOURI

Its principal raw materials and transportation facilities offering opportunities for industry, with additional facts on the reverse side pertaining to industry and its growth within the state.

## Minerals

### Counties in which material is commercially produced

**Asphaltic sandstone**—68, 69, 80  
**Barytes**—55, 56, 57, 58, 61, 64, 65, 67, 75, 76, 77  
**Clay**—37, 42, 48, 49, 50, 58, 59, 60, 61, 62, 66, 74, 75  
**Coal**—4, 5, 6, 7, 14, 15, 16, 17, 22, 23, 24, 25, 28, 29, 30, 31, 32, 33, 34, 35, 38, 39, 40, 41, 42, 43, 45, 48, 50, 52, 53, 63, 68, 69, 80, 81, 82  
**Coke**—62  
**Fuller's earth**—109, 110  
**Granite**—90  
**Hematite**—74, 75, 88  
**Iron ore**—60, 61, 66, 73, 74, 75, 87, 88, 90, 91, 92, 102, 103, 104, 105, 106, 107, 108  
**Lead**—76, 77, 82, 83, 84, 91, 91, 98  
**Lime**—27, 35, 36, 78, 82, 83, 84, 96  
**Limestone**—19, 27, 35, 36, 37, 41, 43, 46, 47, 62, 78, 84, 93  
**Limonite**—89, 105, 107, 108  
**Marble**—78, 82, 84  
**Natural gas**—37  
**Petroleum**—44  
**Portland cement**—35, 37, 62, 93  
**Pyrites**—61, 73, 74, 75, 90, 91  
**Sand and gravel**—19, 27, 36, 37, 58, 61, 62, 67, 74, 92  
**Tripoli**—94  
**Tungsten**—91  
**Zinc**—82, 83, 84, 94, 98

Cobalt, nickel and copper ores together with chats and silver are all extracted in the process of smelting other ores. Sandstone also is obtained along the Missouri river banks.

**Corn**—all counties

**Cotton**—106, 108 to 114

**Soybeans**—2, 4, 6 to 9, 13 to 19, 21 to 27, 29 to 49, 51 to 56, 63, 68 to 70, 72, 76, 80 to 84, 92 to 94, 98, 104, 107 to 114

**Sweetpotatoes**—2, 4, 9, 11, 16, 20, 23, 24, 26 to 33, 36 to 41, 44 to 48, 50, 51, 53 to 114

**Some rice and flax**

## Timber\*

**Upland hardwoods**—50, 51, 54, 55, 57, 59 to 67, 70 to 79, 83 to 88, 91 to 101

**Shortleaf pine-oak type**—76, 87 to 92, 100 to 108

**Cypress, gum and bottomland hardwoods**—92, 93, 108 to 114

\*The survey of Missouri timber resources is not yet available covering the northern and western parts of the state where farming is conducted on an intensive scale.

Natural gas is available for consumption in the following counties—17, 20, 21, 27 to 29, 31, 33 to 42, 44 to 49, 56, 58, 62, 67, 68, 77, 82, 83, 84, 91, 94, 96, 98, 108

— Railroads  
 — Navigable waterways  
 — Airlines

■ Airports—also at principal cities printed in red





## Missouri

(Continued from page 165)

million people are engaged in manufacturing. However, the number of people actually engaged in agriculture is approximately equal to the number employed in industry.

In 1939 the total cash farm income amounted to \$276,744,000 made up of \$62,611,000 from crops and \$186,001,000 from livestock and livestock products. This compares with a total of \$252,867,000 for 1938, a gain in 1939 of more than \$23,800,000. The aggregate farm crop acreage was 12,205,100 acres.

The principal crops in 1939 were: 440,000 bales of cotton lint yielding \$19,173,000 from 375,000 acres plus \$3,322,000 from 195,000 tons of cottonseed; \$13,119,000 from 29,241,000 bushels of wheat; and \$8,147,000 from 109,000,000 bushels of corn. Production of oats totaled 40,920,000 bushels. Other important crops were tobacco, sweet potatoes, orchard and market crops.

The number of livestock in Missouri in 1939 was 8,897,000 valued at \$205,543,000, the largest item being 2,802,000 cattle valued at \$111,647,000. Cash farm income from dairy products in 1939 was \$32,160,000 and factory production of butter in 1938 amounted to 93,265,000 pounds, cheese totaled 16,451,000 pounds and condensed, evaporated and powdered milk were 8,002,000, 68,914,000, and 22,384,000 pounds respectively.

## Timber

MISSOURI occupies an important position as a producer of hardwoods. Of a total forest area of 15,596,000 acres, saw timber occupies well over 2,835,000 acres and carries a stand of saw timber estimated in 1930 (the latest year for which statistics are available) at 3,689,000,000 board feet including 289,000,000 board feet of softwoods and 3,400,000,000 board feet of hardwoods.

The timber species common to Missouri include oaks, gums, ash, maple, sycamore, elm, birch, beech, black walnut, pecan, together with shortleaf pine and some cypress.

In 1938 the total lumber sawed amounted to 53,249,000 board feet of which 38,386,000 board feet was hardwood and 14,863,000 board feet was softwood. The quality of Missouri hardwood is evidenced by the fact that the average price per 1,000 feet at the mill in 1938 was \$22.11 compared with the national average of \$21.45.

## Mining and Minerals

MINERALOGICALLY, Missouri is one of the most important states in the country and possesses the distinction of being the source of our first lead ore mine. Production of lead in 1938 exceeded 122,027 short tons.

On the accompanying map are shown those minerals which are at present being commercially produced. However, this represents only part of the picture for many new deposits of these same minerals are being put into production from year to year. In addition, other deposits and minerals are in process of investigation with satisfactory prospects in view.

Rock wool, one of the most progressive of present day mineral industries, is likely to become a flourishing industry in Missouri as a result of surveys in St. Louis, Boone and Pike counties where Sedalia limestone with the proper chemical composition has been found in a central formation with outcroppings adjacent to the railroads. One rock wool plant already has been established in Boone county.

Another potential source of development lies in the western counties where oil and gas are already being produced. During recent years much development has taken place with shallow fields and it is possible that completion of detailed plane table surveys will result in heavier producing deeper wells as well as more extensive fields.

In southeast Missouri undeveloped clay deposits have been known for many years. Recently these have been investigated and preliminary results indicate the possibility of commercial production of ceramic and bleaching clays which would augment the present important ceramic industry of Audrain, Calloway and Montgomery counties.

The occurrence of strontium bearing minerals is also being

explored but commercial utilization has not yet been satisfactorily demonstrated.

Cobalt and nickel ores together with copper and silver are all produced in Missouri but are mainly extracted in the course of smelting of concentrates of other minerals. Cobalt, copper and nickel occur in small percentages in a large tonnage of complex ore in Madison county.

Sandstone of an attractive color and found in riprapping the Missouri river banks is used as a decorative rock on residence and similar type buildings but is no longer used for general building purposes because of its friability.

## Electric Power

A PART from the electric power facilities dependent upon the generating capacity of plants located within the state, Missouri is assured of ample supplies through the extensive network of systems connecting with adjoining states.

At the close of 1939 there were 108 plants in the state, together capable of generating 770,660 kilowatts. Of this amount, 38 steam power plants had a capacity of 572,328 kilowatts, 7 hydroelectric plants were capable of 151,145 kilowatts, and 63 internal combustion plants had a capacity of 47,187 kilowatts.

Production of electric energy by private and public plants in 1939 totaled 1,604,580,000 kilowatt hours, including 1,297,559,000 kilowatt hours generated by fuel operated plants and 307,021,000 kilowatt hours by water power plants.

## Taxation

THE corporation franchise tax of Missouri provides that all domestic corporations shall pay an annual tax equal to one-twentieth of one percent of the par value of its outstanding stock and surplus. Foreign corporations are required to pay a like amount on such of their capital stock and surplus as may be employed within the state.

The state tax rate, which at present is 15 cents per \$100, is based upon assessment of all real and personal property. There is a constitutional limit of 50 cents per \$100 for county levies and a similar limit of 65 cents per \$100 for the school district tax. Manufacturers are assessed upon all raw materials and finished products as well as upon tools, machinery and appliances. The assessed value of all taxable property in 1939 was \$3,793,597,137.

The state income tax for individuals is graduated from one percent on less than \$1,000 to four percent on \$9,000 and over. From the \$1,000 and over taxable base there is a permissible deduction from the amount of the tax varying from \$5 to \$135 according to the rate of tax payable. The corporation income tax is levied at a flat rate of two percent upon net income taxable to the state of Missouri with no exemptions.

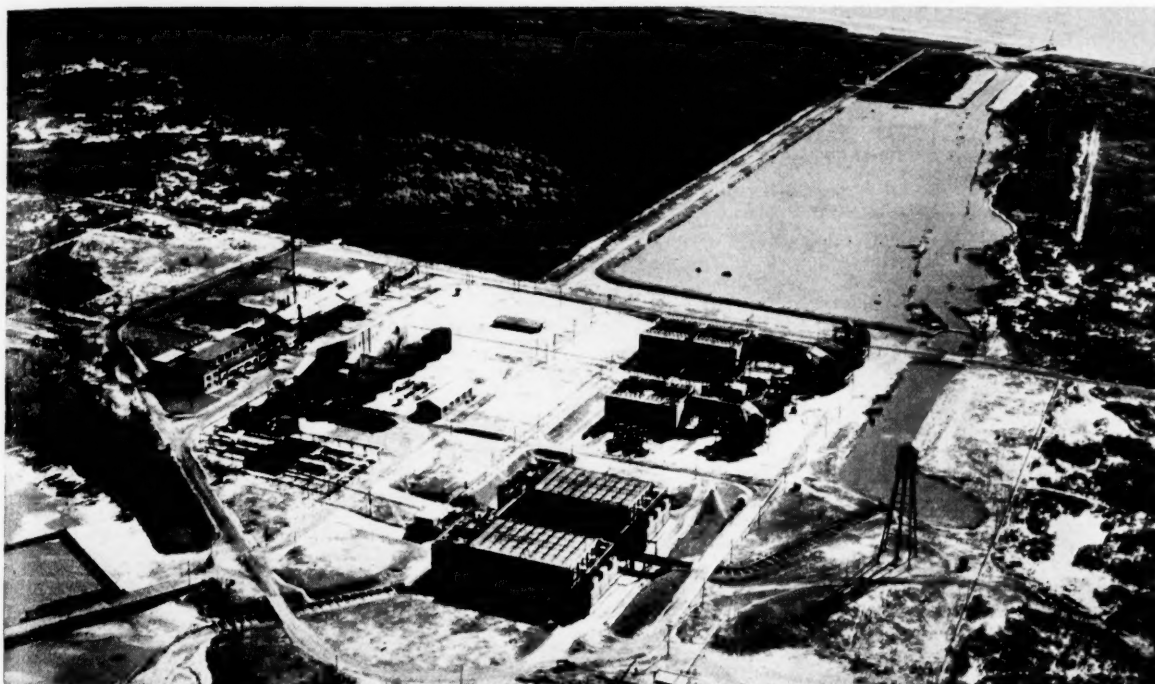
The total Federal internal revenue tax receipts for the calendar year 1939 were \$128,715,254 of which \$51,821,830 represented income tax.

## Labor and Wages

ALTHOUGH, according to the 1930 census, Missouri has four cities with a population exceeding 50,000 inhabitants—St. Louis, 821,960; Kansas City, 399,746; St. Joseph, 80,935; and Springfield, 57,527, and the urban population is approximately 51 percent, the rest of the population is evenly distributed in this state where the density is only 57 to the square mile. Nearly 82 percent of Missouri's white population is of native American parentage and only 4.4 percent are foreign born. Less than 14 percent are of foreign stock.

Because of the great diversity of employment conditions in manufacturing together with the number of industries and the variety of locations, it is virtually impossible to arrive at any useful conclusion regarding average wage rates or even the range of wage rates. However, in view of the fact that almost every county supports some industries and there are many nearby populous centers, there is usually an abundance of labor for all purposes.

# NORTH CAROLINA



One of the most interesting industries recently established is the world's only plant of the Dow Chemical Company at Wilmington where bromine is extracted from sea water.

## A DECADE OF PROGRESS IN NORTH CAROLINA

BY

**J. T. Anderson**  
*Industrial Engineer,  
Division of Commerce & Industry,  
N.C. Dept. of Conservation & Development*

NORTH Carolina has maintained its industrial growth through the decade just closed, and enters the next decade as a leading state in new industrial gains. During this period, 1930 through 1939, the state showed a net gain over losses of more than 400 manufacturing establishments. The peak of this industrial activity was reached in 1938 through 1939, when a total of 214 new plants began operation and additions were made to 207 existing establishments. The state's comparative position was first in the South in the number of wage earners, second in wages paid, and third—ranking just below Texas and Missouri—in the total number of establishments and value of manufactured products.

Outstanding in the past ten years were North Carolina's gains in the chemical industry, the total new capital invested in this field amounting to more than \$15,000,000. A substantial part of this capital expenditure went into the pulp and paper industry—two new mills being constructed and a large addition

to a third plant. Efforts are now underway to enlarge the industry by the establishment of a newsprint mill to utilize large acreages of southern pine in the state. According to a number of engineers, the establishment of newsprint manufacture in North Carolina represents one of the principal industrial opportunities in the South today. The prospects for such a plant are enhanced by the fact that North Carolina has had for some years a well established forest conservation program, maintaining fire control over millions of acres of forest lands and two well equipped nurseries to supply seedlings for replanting purposes. The perpetuation of the wood supply has become a most profitable undertaking.

As the number of mills making changeovers from cotton to rayon and silk increases

in this and surrounding states, a great deal of interest is being manifest in the possibilities of North Carolina locations for rayon fibre and yarn mills. Proximity to pulp sources and supplies of cheap coal, local markets, and an abundance of excellent water for processing purposes, are the chief factors favoring this industry in North Carolina.

A second field of development showed great activity in the Thirties—the full fashioned hosiery industry. New and modern hosiery plants have sprung up in all sections of North Carolina, enabling the state to outstrip all others in this respect.

In 1930, there were some 150 hosiery mills, seamless and full fashioned, in the state. Through 1939, this number had increased to 240 mills, or a gain of 60 per cent. Considering the full fashioned industry separately, however, the increase has been phenomenal. In 1930, there were slightly more than 1,000 full fashioned machines in the state. This number had grown in 1939, to 2,711 machines (in 74 plants), or an increase of some



143 per cent over 1930. The number of new full fashioned mills going into operation during this ten-year period was approximately 50, entailing a capital outlay of between fifteen and twenty million dollars.

In 1930, there were only 18 mills in North Carolina producing rayon and silk yarns and goods. Today there are some 70 mills operating wholly or in part in this field, having a combined total of approximately 350,000 spindles and 15,000 looms.

Along with cotton, rayon, silk, and hosiery, it is felt that a fourth major industry in the textile field is ripe for development in North Carolina—the manufacture of woollens and worsteds. All the favorable factors, which have given such wonderful impetus to the other branches of the textile industry, are present in the state for woollen and worsted manufacture. Goods produced here may be placed overnight in the hands of the cutting trade in Philadelphia, New York, and Boston. A number of choice locations for woollen and worsted plants are available in North Carolina for manufacturers interested in investigating operating possibilities in this state.

For many years North Carolina has ranked as one of the country's leading agricultural states. Three distinct industrial opportunities connected with the utilization of farm products, are outlined briefly.

In one section of North Carolina alone,

*Top—The Ecusta Paper Company plant at Brevard is the first large mill in this country to manufacture cigarette paper. Left center—The Cannon mills at Kannapolis are the world's largest producer of towels. Right center—This plant of the Carolina Aluminum Company at Badin shares with Niagara Falls, N. Y., the distinction of supplying 26 percent of the nation's new aluminum. Bottom—The Champion Paper & Fibre Company's mill at Canton is but one of North Carolina's pulp and paper mills in an industry that is growing rapidly.*

more than 500,000 head of hogs are grown annually for market; and although the state is a leading consumer of pork products, there are no large packers in the state at the present time. The state grows enormous crops of excellent fruits, berries, and vegetables, but has few canners or processors of these abundant farm crops. North Carolina is a leading producer of peanuts, soy beans, and sweet potatoes—three crops of increasing importance to the chemical industry—but as yet has practically no industrial utilization of these crops.

It is felt that plans for a mill in North Carolina to manufacture sweet potato starch for use in the contiguous textile mills of this and other southern states, merits attention. The state has prepared considerable data on the prospects for such an operation, and has developed community interest in several localities to aid in financing such a project.

With the outbreak of war in 1939, the min-

ing industry, which had already shown considerable activity due to the discovery of new and important mineral deposits, was greatly accelerated. In spite of the increase in the extractive industry, however, the manufacture of finished products from North Carolina minerals remains relatively small in the state. The mining industry offers especially attractive opportunities for further development of operations in kaolin, talc, pyrophyllite, lithium, kyanite, vermiculite, asbestos, mica, and feldspar. The state Geologist is equipped to render valuable assistance to firms or individuals wishing to investigate the mining industry and its possibilities in North Carolina.

Other fields which hold definite promise for further development in North Carolina, include the manufacture of products allied to the furniture industry, such as hardware and fittings, household furnishings, paints, varnishes, and glass; garments and other wearing apparel; and textile finishing and dyeing.

Outside of the many natural advantages prevailing in North Carolina for the development of industry, much credit for the progress already made and the bright prospects for the future must go to the progressiveness of the commonwealth and its people. The industrial-mindedness of the state has been reflected in a number of legislative policies designed for the specific purpose of enlarging and strengthening the whole economic structure.

(Continued on page 178)



# ☆☆☆☆ Let's Go ☆☆☆☆ AMERICA!

☆ All along the line industry is shifting into high gear. Production must be uninterrupted. It must be surrounded by the most favorable conditions.

Industrialists in a great many lines faced with the immediate problem of building new plants or expanding present operations are looking to North Carolina because of its great natural advantages due to strategic location, raw materials and leadership.

A mild, year-round climate cuts construction and production costs and assures uninterrupted operations.

Friendly, cooperative labor, 99% native

born, with the lowest percentage of foreign born population in the Union.

More than 55% of the nation's population, including the world's richest markets, lives within a 600 mile radius of North Carolina. Excellent transportation, by rail, highway and water. Cities with deep-sea ports, having complete terminal facilities.

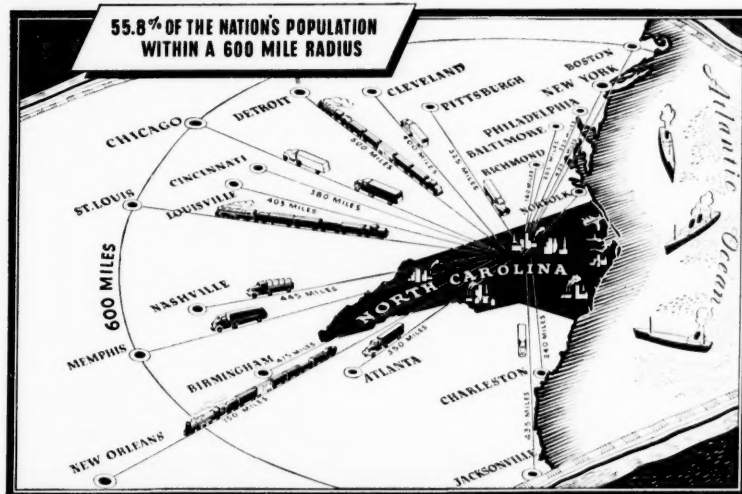
Vast raw material supply. Abundant power. One of the fairest tax structures in the country. Business-minded legislation.

Experienced industrial engineers will advise you on opportunities for *your industry* in North Carolina. Write today.

## DEPARTMENT OF CONSERVATION AND DEVELOPMENT

Division of Commerce and Industry

Raleigh, North Carolina



# NORTH CAROLINA



# North Carolina—

## And its Diversified Resources for Industrial Development

**N**ORTH CAROLINA was the "cradle" of English civilization in the New World. After two unsuccessful attempts at settlement on Roanoke Island in 1584 and 1587 by Sir Walter Raleigh, a colony was eventually established on the Chowan river about 1653 by a group of Virginians. In 1663, Charles II granted a charter for Carolina to eight proprietors who ruled the land under a constitution prepared by John Locke. In 1729, proprietary rule was superceded when the king bought out the palatinates and proclaimed North Carolina a royal colony. As such it continued until May 20, 1775 when the Mecklenburg Convention adopted a declaration of independence at Charlotte. This was followed on April 12, 1776 by the Halifax resolutions of Independence. During the Revolution North Carolina furnished more than ten percent of the American army and later was one of the original thirteen states. Equally famous with other historical dates is December 17, 1903 when Orville and Wilbur Wright made the first successful flight with an airplane at Kill Devil Hill.

With a population estimated at 3,492,000 in 1937, North Carolina ranked 12th, and 27th in size having a total area of 52,286 square miles of which 3,620 square miles are water.

### Climate

**T**HE topography of North Carolina can best be described as a vast slope, extending from the mountains of the West, with altitudes of nearly 7,000 feet, to the level of the Atlantic.

Climatically, North Carolina is typical of the warm temperate zone lying approximately at the same parallel of latitude as the Mediterranean but is affected by its position with relation to the ocean and high mountains. The mean temperatures for the three physiographic regions are: Mountain, 55° Fah; Piedmont, 60° Fah; Coastal Plains, 62° Fah. The annual mean temperature for the state is 59 degrees.

### Transportation

**N**ORTH CAROLINA is within 600 miles of more than 55 percent of the entire population of the United States. Direct communication by rail, air, water, and highway is possible with the nation's richest markets.

With respect to available transportation facilities for industrial expansion, North Carolina ranks among the most progressive states. The first state to take over the maintenance of all highways within its borders, it now includes nearly 60,000 miles of which the state system comprises about 11,500 miles and the county system over 48,000 miles. Approximately 4,000 miles are hardsurfaced and 22,500 miles are low-type surfaced.

Rail transportation facilities compare favorably with those found in any other Southern State. Five great trunk lines operate in the State, with more than thirty independent short lines doing business wholly within North Carolina. The total track mileage is approximately 4,800 miles.

Truck lines are well developed. Two air routes of Eastern Air Lines; two deep sea ports—one at Wilmington and one at Morehead City-Beaufort, and the Intra-coastal Waterway provide other means of transportation. The value of foreign trade through the North Carolina customs district in 1939 totaled \$24,166,856.

### Manufactures and Finance

**T**HE value of North Carolina's manufactured products in 1937 was \$1,384,737,686, a gain of \$280,826,756 or almost 25 percent over the 1935 figure of \$1,103,910,930. Of the 67 industries listed separately by the Bureau of the Census, 47 had products valued in excess of one million dollars while 149 establishments listed as "other industries" together totaled \$116,529,849.

Far outranking all other industries was that of cigarette making with an output valued at \$536,915,093. Other important manufactures include: cotton fabrics, \$189,395,796; cotton yarn and thread, \$101,680,175; hosiery, \$79,809,982; dyeing and finishing yarns and threads, \$52,915,321; furniture, \$48,412,936; rayon fabrics, \$45,291,728; lumber, timber and planing mill products, \$39,217,389; clothing, \$20,073,890; fertilizers, \$16,002,312; beverages, \$13,986,748; flour and other grain mill products, \$13,589,866; tanned, finished and curried leather, \$12,227,035; and cottonseed oil, cake and meal, \$11,435,672.

Altogether, the 2,896 establishments (an increase of 297 over the 1935 number) employing 258,771 wage earners with a payroll of \$189,265,474, used materials, fuel, electric power, etc., valued at \$908,903,243. The total capital invested in manufacturing, exclusive of lumber and woodpulp, is estimated in excess of \$850,000,000.

The aggregate resources of the state's 228 banks reporting to the Comptroller of the Currency on June 30, 1939 was \$490,804,000. Individual deposits were \$430,626,000 and savings deposits \$96,694,000. Bank transactions of the three reporting clearing house exchanges in 1939 were \$1,144,453,000 compared with \$1,218,762,000 for four exchanges in 1938.

### Agriculture

**A**LTHOUGH the net cash farm income of North Carolina is not much more than 20 percent of the value of the state's manufactured products and is only about half of the value "added by manufacture," agriculture nevertheless occupies an extremely important part in the economy of the state. Of the \$240,543,000 total cash farm income in 1939, \$38,484,000 was derived from livestock and livestock products and \$182,167,000 from crops grown on an aggregate 6,654,800 farm crop acres.

The largest income producing crop was tobacco with \$121,502,000 from 773,810,000 pounds grown on 815,800 acres—an average yield per acre of 949 pounds. Cotton production amounted to 455,000 bales from 746,000 acres with an income of \$20,337,000 while 202,000 tons of cottonseed resulted in an additional \$2,368,000. Other important farm crops and their production were: peanuts, 302,100,000 pounds from 265,000 acres; sweetpotatoes, 8,624,000 bushels from 77,000 acres; oats, 5,692,000 bushels from 253,000 acres; wheat, 5,100,000 bushels from 425,000 acres; corn, 48,087,000 bushels from 2,466,000 acres; peaches, 1,395,000 bushels; and apples, 580,000 bushels. The total estimated income from commercial and non-commercial truck crops was \$4,920,000.

The 2,281,000 livestock valued at \$90,865,000 included 684,000 cattle worth \$22,010,000 of which 385,000 were cows and heifers kept for milk (value \$16,170,000), 1,167,000 swine and 71,000 horses valued at \$8,358,000 and \$7,892,000 respectively. Cash farm income from dairy produce aggregated

(Continued on page 176)

# CHARLOTTE

Center of the South's Full-Fashioned Hosiery Industry Is The Logical Distributing Point and Branch Location For Concerns That Sell to the SOUTHERN TEXTILE INDUSTRY

## CONSIDER THESE FACTS:

CHARLOTTE is the center of the Carolinas where are located nearly two-thirds of all the spindles, two-thirds of all the looms and almost half of all the knitting machines in the South. NORTH CAROLINA is now the first State in knit goods manufacture in the South, with Tennessee second.

CHARLOTTE is headquarters for the American Cotton Manufacturers' Association, Southern Textile Association, North Carolina Cotton Manufacturers' Association, and the Southern Hosiery Manufacturers' Association.

CHARLOTTE is the location of the Southern Shops of Whitin

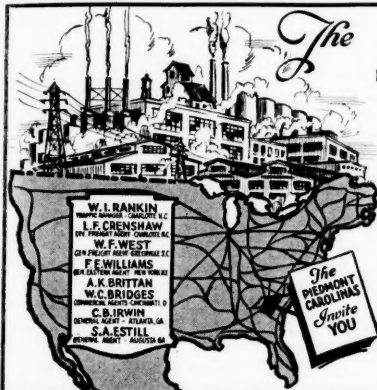
Machine Works, Crompton & Knowles Loom Works, Saco-Lowell Shops, and Parks-Cramer Co.; and the Southern Laboratories of nationally known chemical and dyestuffs manufacturers.

CHARLOTTE is connected with all the important textile points in the Carolinas, Tennessee, Virginia and Georgia by hard surface highways.

CHARLOTTE is on the Eastern Air Lines with 6 planes to carry mail and passengers and is but an overnight ride by train to a population of over 15,000,000 people.

CHARLOTTE has 2 large national banks and 2 large state bank and trust companies and the Carolina Branch of the Federal Reserve System.

For Further Information Write Clarence O. Kuester, Business Manager, The Charlotte Chamber of Commerce, Inc. Charlotte, N. C.




*The* **LIFE BLOOD** *of American Industry*  
is her  
**RAIL TRANSPORTATION SYSTEM**

In addition—however—to the all important job of transporting industrial commodities with—safety, punctuality and dependability—this vital blood stream must provide strategic and desirable locations for the expansion of established interests and the development of new enterprises.

The **PIEDMONT AND NORTHERN RAILWAY COMPANY** in her proud identification as a part of this great system is happy to offer such locations in a friendly and progressive region—endowed with an ideal climate, abundant and economical electric power, intelligent and reliable labor and reasonable taxes.

*A Survey is yours on request.*

**PIEDMONT AND NORTHERN RAILWAY COMPANY**  
"BUILT TO SERVE" GENERAL OFFICES "SERVES TO BUILD"  
CHARLOTTE, N.C.



W. I. BANKIN  
NORTH CAROLINA - CHARLOTTE, N.C.  
L. F. CRENSHAW  
SOUTH CAROLINA - COLUMBIA, S.C.  
W. F. WEST  
GEORGIA - ATLANTA, GA.  
F. E. WILLIAMS  
FLORIDA - MIAMI, FL.  
A. K. BRITAIN  
ALABAMA - MOBILE, AL.  
W. C. BRIDGES  
LOUISIANA - NEW ORLEANS, LA.  
C. D. IRVING  
MISSISSIPPI - JACKSON, MS.  
S. A. ESTILL  
KENTUCKY - LEXINGTON, KY.

The  
**PIEDMONT  
CAROLINAS**  
Invite  
YOU

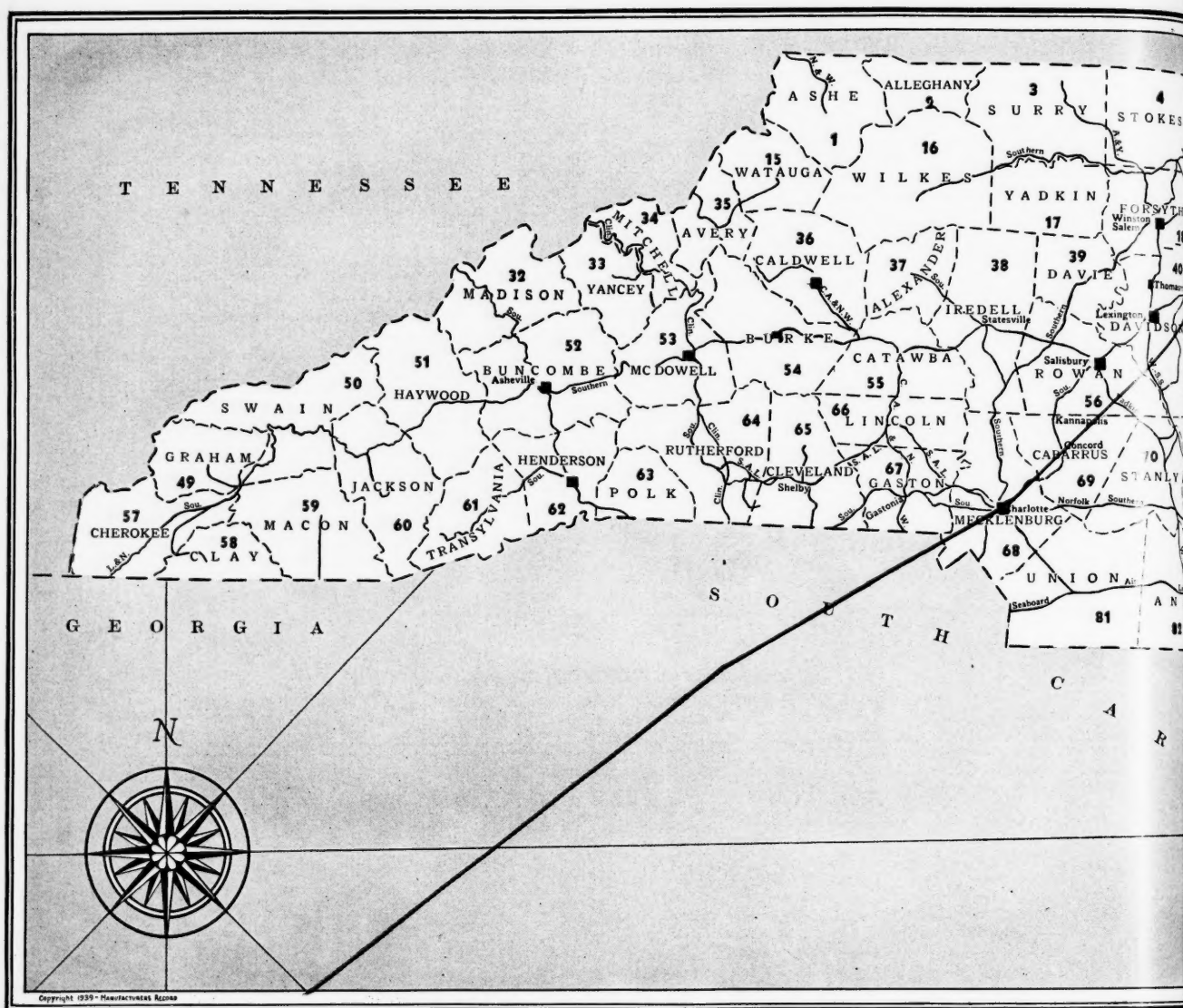
# HANES HOSIERY MILLS CO.

WINSTON-SALEM, N. C.

WORLD'S LARGEST PRODUCERS OF FINE GAUGE  
LADIES SILK CIRCULAR KNIT HOSIERY

NEW YORK OFFICE  
HANES ASSOCIATED MILLS  
271 CHURCH STREET





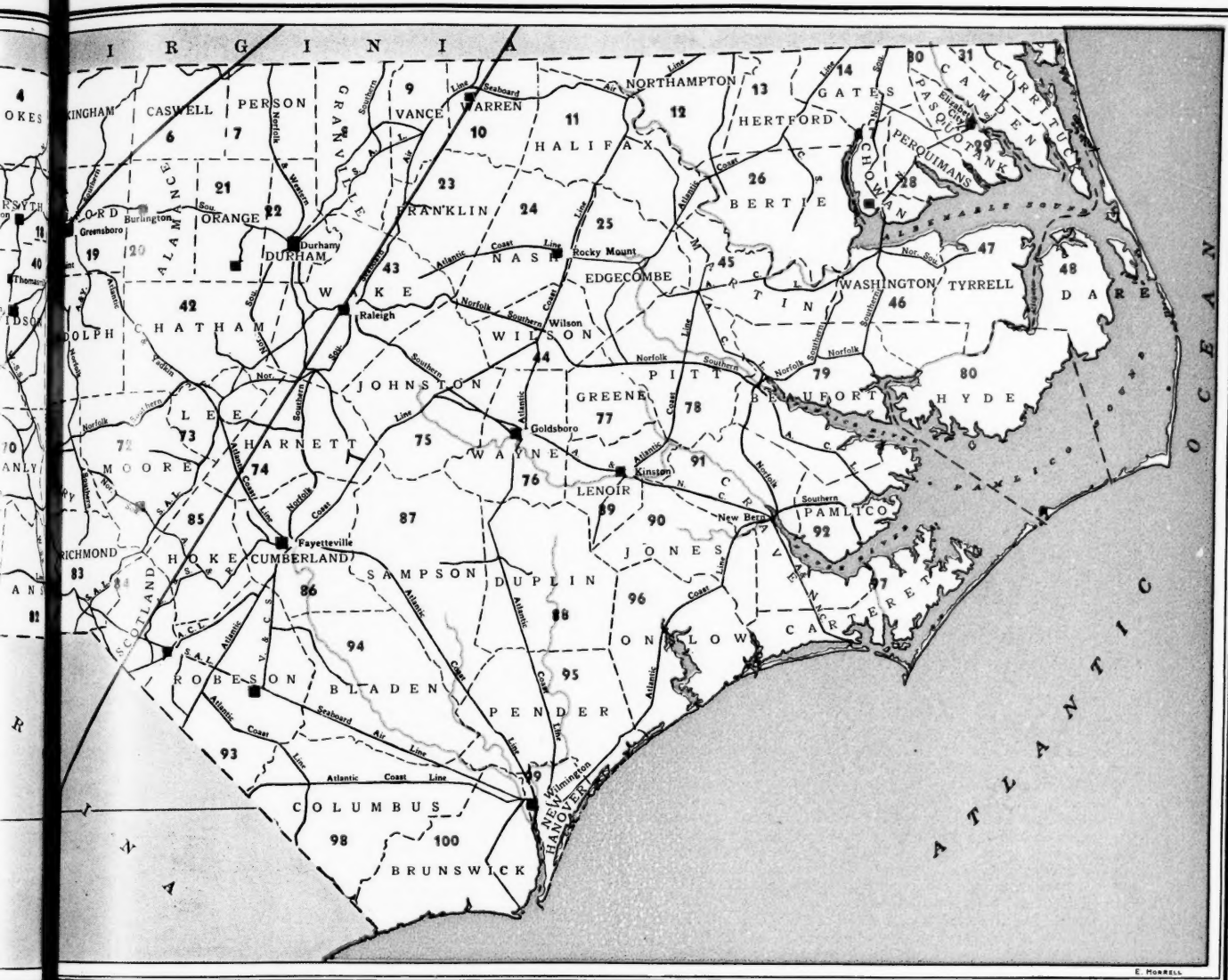
# NORTH CAROLINA

Its principal raw materials and transportation facilities, with facts on the reverse side about its industrial growth and opportunities for industry.

## Minerals

Asbestos— 33  
 Bromine— 99  
 Clay— 33, 34, 35, 41  
 Copper— 50  
 Feldspar— 33, 34, 35, 50  
 Garnet— 33  
 Gold (placer)— 16, 19, 54, 70  
 Gold (lode)— 11, 50, 55, 64, 67, 68, 71, 81  
 Kyanite— 33  
 Lime— 62

Mica— 33, 34, 35, 36, 53, 59, 60  
 Olivine— 60  
 Pyrophyllite— 41, 72  
 Sand & gravel— 32, 36, 52, 72, 74, 76, 82, 99  
 Silica (quartz) 34, 82  
 Silver— 11, 50, 55, 64, 67, 68, 72  
 Stone— 2, 3, 5, 9, 11, 15, 17, 18, 19, 21, 32,  
 34, 38, 43, 50, 52, 54, 55, 56, 57, 59, 61,  
 62, 64, 66, 67, 71  
 Talc— 34, 57  
 Vermiculite— 59



#### Timber

**Gums & mixed lowland hardwoods**—12-14, 26-31, 45-48, 75, 76, 78-80, 86-88, 90-100  
**Hemlock**—1, 2, 15, 16, 32-36, 49-54, 57-64  
**Loblolly pine**—8-14, 23-31, 42-48, 72-80, 84-100  
**Longleaf pine**—71-74, 83-88, 90, 91, 93-100  
**Shortleaf pine**—1-7, 15-22, 35-41, 53-56, 63-71, 81-83  
**Spruce**—15, 33-35, 50-52, 60  
**Upland oaks, hickories & other hardwoods**—1-7, 15-22, 32-41, 49-71, 81-83

#### Agricultural Products

**Corn**—all counties  
**Cotton**—17, 37-39, 54-56, 64-69, 81  
**Peanuts**—1-100. (principal)—11-14, 25-27, 45, 46, 77-79, 89-92, 96, 97  
**Pecans**—8, 9, 11-14, 20, 23-29, 31, 38, 40-47,

64, 65, 68, 72-86, 88-100

**Soybeans**—1-100. (principal)—28-30, 75, 76, 78, 80

**Sweetpotatoes**—all counties

**Tobacco (bright leaf)**—3-14, 17-27, 37-46, 55, 56, 66, 68-79, 81-100

**Tobacco (burley)**—1-3, 15, 16, 32-36, 49-54, 57-64

#### Commercial Fisheries

26, 30, 31, 45, 79, 91, 92, 95, 96, 97, 99, 100

## North Carolina

(Continued from page 172)

\$22,604,000 including \$4,628,000 from chickens, \$5,346,000 from eggs and \$12,630,000 from milk.

### Timber

**A**LMOST 60 percent of North Carolina's entire land area of 31,194,000 acres is classified as forest land and of this more than 18,160,000 acres are in commercial forest.

The saw timber area consisting of 9,045,000 acres and bearing 43,080,000,000 board feet is made up of 2,265,000 acres of old growth and 6,780,000 acres of second growth. Softwoods, comprising 6,570,000,000 board feet of old growth and 21,200,000,000 board feet second growth, total 27,770,000,000 board feet while 7,850,000,000 board feet of old growth and 7,460,000,000 board feet second growth give a total of 15,310,000,000 board feet of hardwoods.

The total cordwood volume measuring 85,990,000 cords consists of 66,140,000 cords (25,445,000 cords of hardwood) on the saw timber area, 18,560,000 cords (7,060,000 cords of softwood and 11,500,000 cords of hardwood) on a cordwood area of 4,780,000 acres, and 1,290,000 cords on restocking areas.

Principal species are: Softwood; loblolly, shortleaf, longleaf, pond and white pines, hemlock, cypress, and white cedar. Hardwood; oaks, red gum, tupelo and black gum, and yellow poplar.

During 1938, some 50,000 persons received major employment in forest products industries. Lumber and timber cut was valued in excess of \$40,000,000, while the value of manufactured forest products was \$123,000,000. The actual lumber cut aggregated 1,370,503,000 board feet including 1,105,621,000 board feet of softwood and 264,882,000 board feet of hardwood.

The State operates two nurseries with a total annual capacity of 6 to 8 million tree seedlings.

### Mining and Minerals

**T**HE \$11,160,444 value of North Carolina's mineral production in 1937 is relatively little indication of that state's mineral wealth. While it is stated that a greater variety of minerals can be found there than in any other state, it is a known fact that North Carolina contains the nation's largest known commercial deposits of non-metallic minerals, including mica, kaolin, spodumene, kyanite, talc and pyrophyllite.

On the accompanying map are shown the minerals now being commercially produced. However, in most instances additional deposits of these same minerals are known to exist, many of them being commercially practicable while others warrant further investigation. The metallic minerals offering the greatest possibilities are gold, silver, copper, chromite, ilmenite and rutile, manganese, lead-zinc, tin and nickel; nearly all of them are confined to the western and west-central counties of the state.

The non-metallic minerals with deposits known or believed to be of commercial possibilities include: asbestos (actinolite and anthophyllite, the amphibole, and chrysotile, the fibrous form of serpentine); barytes which occur in series of pockets or lenses principally in Madison and Gaston counties; kaolin clays in Richmond, Wilkes, Lincoln, Cleveland, Avery, Mitchell, Yancey, Haywood, Jackson and Macon counties; brick and tile clays in almost every county; coal, mainly in Moore and Stokes counties; kyanite in more than twenty counties but most of it in Yancey county; feldspar which occurs in ten counties with the largest number in Avery, Mitchell and Yancey counties; mica and vermiculite, which consists of a belt about 100 miles wide extending from Ashe county south and southwest through 18 counties; quartz though found in at least eight counties is mainly confined to Gaston, Mitchell, Avery and Yancey counties; stone, most outstanding of which is granite, is widely distributed throughout the state with the world's largest open face granite quarry located at Mount Airy; marl is found in almost every one of the eastern counties; marble in Swain and Cherokee counties; limestone deposits in 12 counties; talc is mainly in Cherokee and Swain counties; pyrophyllite principally in Moore county; and spodumene, a source of lithium, in large deposits in Alexander, Cleveland and possibly other counties.

### Commercial Fisheries

**C**OMMERCIAL fishing has always been an industry of great importance to people living along the coast since the beginning of the State. Employment is given to some 15,000 persons engaged in fishing and in fisheries establishments in the coastal counties.

From the commercial fishing waters of North Carolina, water products valued at \$5,875,456 were taken in the period July, 1936 and June 1938. The total food fish caught aggregated 89,



The sections of **NORTH CAROLINA** served by this company (indicated by shaded areas on map) offer a wide variety of industrial advantages appealing to manufacturers in many lines!

**It may be  
that the very  
location you  
are seeking  
is in**

**NORTH  
CAROLINA**

For accurate, timely facts about **NORTH CAROLINA'S** industrial resources and specific information about a location within our territory, write us fully relative to your requirements . . . an engineering service in furnishing data covering your particular needs will be rendered without cost or obligation to you.

AGRICULTURAL & INDUSTRIAL DEVELOPMENT DEPARTMENT

**CAROLINA**  
POWER & LIGHT COMPANY  
RALEIGH, NORTH CAROLINA





155,000 pounds valued at \$3,277,650, the principal items being: herring, 30,000,000 pounds; trout, 17,000,000 pounds; croakers, 12,000,000 pounds, and spots, 11,000,000 pounds. Other food fish species exceeding one million pounds were mullet, shad, butters and flounders. Shrimp totaled 3,305,000 pounds while 340,700,000 menhaden valued at \$1,703,500 was the largest single item caught. Shell fish included 10,000,000 pounds of hard crabs, 157,878 dozen soft shelled crabs, 479,888 bushels of oysters and 93,282 bushels of clams.

### Electric Power

**N**ORTH CAROLINA ranks fourth in the nation in hydro-electric capacity. Six major public utility systems, together with a number of smaller utility companies, produced a total of 2,488,617,000 kilowatt-hours of electric energy for public use during 1939. Of this amount, 1,322,358,000 kilowatt hours originated from water power at hydro-electric plants.

These utilities, including 87 plants, have a total installed capacity of 1,054,053 kilowatts. Fifty-three hydro-electric plants are capable of 651,695 kilowatts, 22 steam power plants have a capacity of 394,375 kilowatts and 12 internal combustion plants make up the balance of 7,983 kilowatts.

A vast system of inter-connected transmission lines covers practically the whole State, and power facilities are available in nearly every locality. Power generation and transmission are ample for present needs. Estimates have shown that nearly a million additional horse-power of electric energy may still be profitably developed in North Carolina.

### Taxation

**N**ORTH CAROLINA has a unique tax system, in that it is one of the few states which imposes no tax on real property for State purposes. It is the only State which maintains its entire public school system and a highway system of 60,000 miles without the imposition of taxes on property, or without requiring the subdivisions to assist from local property taxes. The only approach to a property tax for State purposes is the tax on personal intangibles, enacted in 1937.

Domestic and foreign corporations pay taxes based on the schedule shown below, with the basis to be used under a, b, or c, being the one that is the greatest:

(a) Capital stock, Surplus (debit or credit) and Undivided Profits.

(b) Total assessed value of property in this State.

(c) Total actual investment in tangible properties in this State.

Tax rate is \$1.75 per \$1,000 on tax basis. The minimum tax is \$10.00.

The income tax on corporations, both foreign and domestic, is as follows:

(1) Corporations carrying on business in this State are liable for income tax on net earnings, the rate being 6 percent. This tax is applicable only to income derived from North Carolina operations.

Property taxes are collected only by cities and counties.

North Carolina has a 3 percent sales tax, applicable on a number of commodities.

It is mandatory, by constitutional amendment, that the State, counties and municipalities pay off their bonded debt at the rate of three dollars of old debt for each two dollars of new debt incurred. Between 50 and 75 percent of taxes collected by the cities and counties goes into debt retirement, while some 20 percent of State collected taxes go for the same purpose.

### Labor and Wages

**T**HERE are two important racial elements in the population of North Carolina, white and negro, with only an insignificant proportion of other races. The foreign born in the population is too small in number to be considered, except for the fact that they have continuously decreased in proportion to the total population. Nearly 71 percent of the population is white.

The adaptability of North Carolina labor has been conclusively demonstrated by the remarkable industrial development experienced in the past two decades. Employers have found the workers peace-loving, loyal, thrifty and intelligent.

North Carolina is a State of small cities and towns (no city having a population of 100,000), and is therefore free from problems prevailing in large metropolitan areas.

Wages paid in North Carolina are reflected in the fact that this State ranked seventeenth in the nation in percent of national buying power (1.4206) in 1937 and was first in both the South Atlantic and East South Central states.

## ELECTRIC DEVELOPMENT

### *Builds* COMMUNITY PROGRESS

For more than 30 years the Duke Power Company has served the Piedmont Carolinas. Through this period, electric service has revolutionized conditions in industry, in commerce and in the home as has no other new development. For many years low-priced electricity has been an important factor in bringing new industries and new enterprises to the Carolinas. Thus communities have grown and prospered with the application of electric service which is now so widespread that it is indispensable to the high standard of living which our citizens now enjoy.

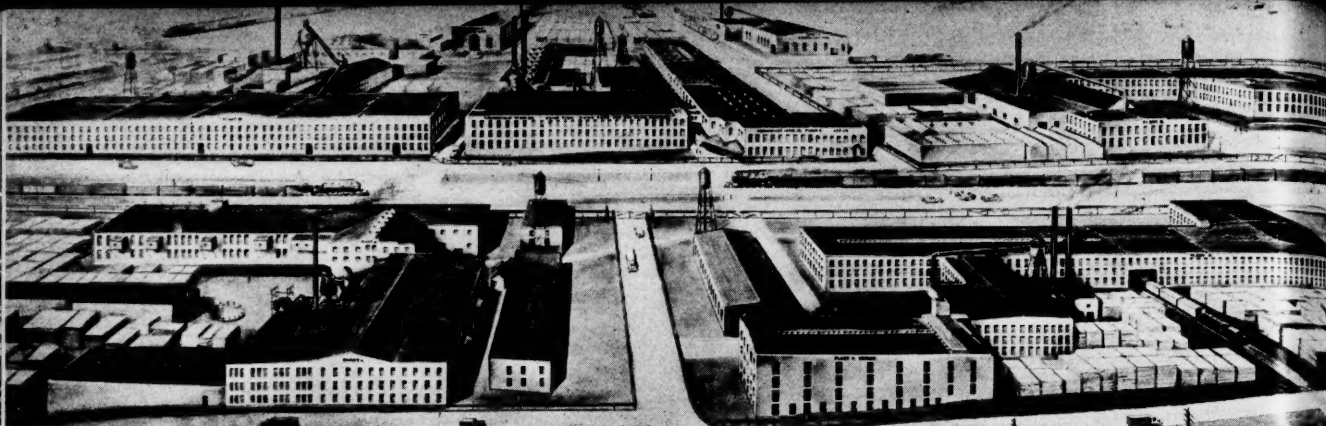
Today, Duke Power Company has almost 1 1/4 million horsepower of installed capacity in hydro-electric and steam-electric plants—abundant to serve growing industrial, commercial and home needs.

The many advantages for industry in the Piedmont Carolinas combine to make it one of the most interesting business sections in the country.

# DUKE POWER COMPANY

GENERAL OFFICE

CHARLOTTE, N. C.



## North Carolina

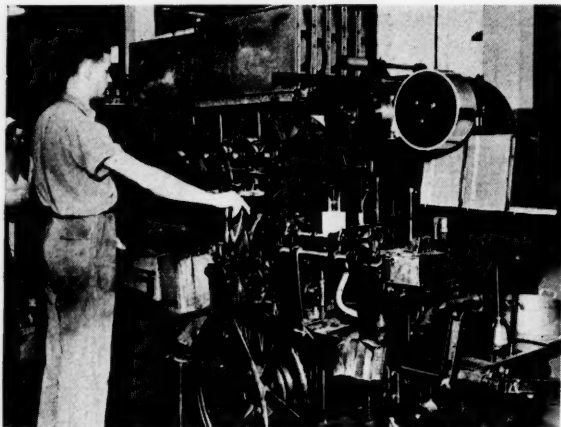
(Continued from page 170)

These policies include fair and equitable labor provisions enacted under the joint sponsorship of employee and employer, and a balanced fiscal setup wherein the rights of all are respected and met.

The laws affecting working conditions, hours, and wages in North Carolina are too generally well-known to require an explanation here. It might prove interesting, however, to examine several phases of the state's fiscal policy.

First, North Carolina has written into its constitution a provision to put the brakes on borrowing and the issuance of bonds by stipulating that before the state or any of its subdivisions can borrow \$2 it must have first paid off \$3 of debt the previous year, or in case of the state, during the previous biennium. The results of this requirement have been remarkable during the period in which it has been in force: from June 30, 1932 through June of 1938, the local governments reduced their bonded debt from \$362,000,000 to \$320,000,000—a reduction over all borrowings of \$42,000,000. From June 30, 1932 through June of 1939, the state reduced its bonded indebtedness from \$175,509,000 to \$152,658,500—a reduction over all borrowings of \$22,850,500. Thus, it has been possible for North Carolina not only to finish every fiscal year since 1932, with a decreasing

*From such cigarette machines as this are produced a total output valued at almost \$537,000,000 each year in North Carolina to place this state above all others in cigarette production.*



*Furniture manufacturing is one of North Carolina's largest industries whose output in 1937 was valued at more than \$48,000,000. This plant of the Thomasville Chair Company is the largest furniture factory in the State.*

bonded debt to "peg" its taxes, but there has been each year a substantial credit balance in the treasury.

Second, North Carolina is one of the few states which levies no taxes on real property. It is the only state which maintains all of the public schools for a minimum term of eight months and all of its roads—county and state—from the state treasury, with no local taxes imposed for these services.

It is altogether likely that the pursuance of such a policy as that outlined above will result in reduced taxes in North Carolina.

A third and increasingly important factor recently has been felt in North Carolina's industrial progress. Reference is made to the state's appropriation of funds to advertise its industrial advantages and opportunities, and the creation of an agency—the Division of Commerce and Industry—to aid established concerns expand and new industries locate in North Carolina.

In addition to developing prospects and locating new industries through its own agency, the Division of Commerce and Industry works in close cooperation with the industrial offices of railroads, power companies, investment houses, private locating agencies, and with chambers of commerce.

Exhaustive surveys covering the investment opportunities in North Carolina have been made and the agency has been responsible during the past several years for bringing to the

attention of manufacturers and investors a new kind of service from a public office. The ordinary methods of presentation, i.e., expensive brochures and literature dealing in generalities about the state, have been passed up for a personalized service.

In a number of cases the establishment of new or branch plants—or the expansion of existing facilities necessitates the raising of at least a part of the capital to finance the venture. Few companies are fortunate enough to be able to pay for such new facilities out of current earnings or surpluses. In dealing with industrial prospects, the Division of Commerce and Industry finds quite a few concerns of worth and reputation whose records of earnings fully justify assistance in the form of new capital. It is a part of the agency's service to bring such prospects to the attention of responsible investment bankers and others who might logically be interested in financing new enterprises.

Large and small scale investments in North Carolina industrial enterprises are not unfamiliar to out-of-state capital. Chance and general good times have, of course, contributed their share to the successes attending some of these ventures; however, the main factors have been and are now cooperative local influences which pertain almost wholly to this particular section of the nation.

Finally, the records prove that the past decade has been a successful one for industrial development in North Carolina. The basic principles of sound economics which have prevailed for many years are being carried over into 1940, and the state looks confidently to the future for a continued enlargement and expansion of its industrial life.

## EXCELLENT PLANT SITES

*With Everything Necessary*

Let us show you what is available along our rails, in Forsyth, Davidson, Montgomery, Stanly and Anson Counties, North Carolina. We offer you: Ample high-class labor. Low power costs. Variety of raw materials in commercial quantities. Many good sites. Good Schools. Cooperative people in making your plant a success. And efficient transportation facilities connecting with all parts of the Country.

### WINSTON-SALEM SOUTHBOUND RAILWAY

S. P. Collier, Traffic Mgr.  
WINSTON-SALEM, N. C.

# OKLAHOMA



*Petroleum, the basis of Oklahoma's largest industry, is evident throughout the state. Here is a group of oil wells in the heart of Oklahoma City with the State Capitol in the background.*

## OKLAHOMA, AN IMPORTANT INDUSTRIAL CENTER OF THE SOUTHWEST

BY

**\* Ernest L. Little**  
*Managing Director, National Farm  
Chemurgic Council*

**O**KLAHOMA, located in the center of the Southwest, has become within a single generation the twenty-first state in population and the seventeenth state in value of tangible wealth. This territory, which, prior to its opening in 1889, was only a cattle country with little mining or agriculture and without any manufacturing, now normally produces over a billion dollars a year in new wealth, almost equally divided between agriculture, mining and manufacturing.

While the State has every reason to be proud of this record, the possible future development in all three branches is beyond

average human comprehension. This future development can be secured because of the basic tools provided by nature. The following examination of these natural resources will reveal their future possibilities.

### **Diversified Agriculture**

Oklahoma agriculture is well diversified between crops and livestock. The State pro-

duces cotton, wheat, corn, cattle and calves, hogs, sorghums, broom corn, white and sweet potatoes, pecans, peanuts, dairying products and many miscellaneous truck crops. It is neither a northern nor a southern state, but occupies a unique position in American agriculture as it lies in both the cotton and wheat belts. Comparatively little wheat is grown south of Oklahoma's southern boundary and yet the state usually ranks second in the production of winter wheat; practically no cotton is grown north of Oklahoma's northern boundary and yet the state ranks as one of the leading cotton states of the nation. All



of the nineteen major plow crops are grown on a commercial scale. The unusual geographic position insures a long growing season, 200 to 210 days in all but fifteen northern counties, thus giving Oklahoma agriculture a double diversity equalled by no other important agricultural state.

According to recent surveys of the United States Department of Agricultural Economics there are sixteen major and ten minor types of farming areas in Oklahoma correlated with soil, climatic conditions and economic opportunity, ranging from cash grain and livestock to general farming, dairying, poultry raising, potatoes, fruit, broom corn and cotton. Within this range of opportunity lies the strength of Oklahoma's present and future agriculture.

The State also has at least 134 species of native trees. This is a greater number than is native to all Europe, even though Oklahoma is commonly known as a prairie state. Native forests range from the bottomland hardwoods and shortleaf pine, oak types of the extreme southeast, through the hardwood type of the Ozarks, the black-jack oak-post oak type, on through the prairies where only native trees occur along streams and in canyons, to the foothill type of the Rockies where pinion pine and scrub oaks form the major portion of the ground cover.

Originally, Oklahoma had over 12,000,000 acres, or 27 per cent of her total area, covered with forests. Today approximately 11,000,000 acres are still classed as forest land. Part is still virgin forest, part has been cut over and part has been cleared and abandoned. The short-leaf pine, oak type, the most important commercial type, covers about 4,000,000 acres, the oak-hickory type covers about 2,000,000 acres and the other 6,000,000 acres are popularly known as black-jack-post oak land.

#### Mineral Wealth

Oklahoma's present position among the states of the nation has undoubtedly been attained, in a large measure, through the great value of her mineral products. It would be a waste of time to discuss the petroleum resources. The history of oil in Oklahoma is older than the state, older than the territory, older than the petroleum business in the United States. In the year 1853, a Federal

Indian agent reported to the Federal Government that the oil springs, in what is now Oklahoma, were attracting considerable attention as a remedy for all chronic diseases. And since that time, the breath-taking cry "She's In," has resounded throughout the state until Oklahoma is now third in the production of petroleum. In 1939 over 153,462,906 barrels were produced within this state and it is estimated there is a known reserve of over 838,200,000 barrels. This does not take into consideration undeveloped areas consisting of the western half of the state.

Last year there was also produced and used over 300,000,000,000 cubic feet of natural gas. The future potentialities in the petroleum industry are beyond the power of description.

The zinc and lead deposits have also played an important part in the development of mineral resources. Zinc and lead ore yearly produce \$17,000,000 of additional wealth to the state. However, that is not all of the mineral resources available for the future development of the state.

One of the greatest fields for future consideration is coal and its derivatives, coke and coal tar. Billions of tons of coal are available. There are also deposits of gypsum, over 123 billion tons, enough glass sand to make all the glass in the world, enough granite to supply the building and monument trade of the United States, asphalt in unnumbered millions of tons, limestone sufficient to burn all the lime and furnish all the crushed rock for America, clays sufficient to make all the brick, sewer tile and clay products for a large part of the world, and Portland cement rock to supply a dozen states. But that is not all. The state also has salt, sandstone, novaculite, tripoli, marble, volcanic ash, barite, bauxite and many other minerals in great quantities, all undeveloped.

#### Population

Agricultural resources, forest resources and mineral resources, tools provided by nature

*The predominance of the petroleum industry in Oklahoma makes necessary many other lines of manufacturing. One of the largest plants in this connection is the Halliburton Oil Well Cementing Company at Duncan.*

plus the capacity of the people to build and create are all available. And what is the character and capacity of the people of this section, who since 1889 have been able to create a state now producing new wealth of over one billion dollars annually?

Homogeneous to an unexampled degree is the population of this area. Its foundation lies in the historical development of the state. The hardy pioneers who settled Oklahoma constituted the most adventurous, most aggressive and most competent, generally, of the people of the North and East, who, during almost a half century, swept into this broad area through the gateways of St. Louis, Kansas City and New Orleans. The era of pioneer immigration is still fresh in the memories of this section and great numbers of the representatives of this pioneer movement are still living, giving character and color to the thought and activity of this entire population. It is no accident that this area, with only a small per cent of the population of the United States, is able to produce 30 per cent of eight of its basic raw materials. The men and their sons who have conquered this area have the capacity to cope with conditions to overcome difficulties which prove terrifying to a less hardy and less experienced race. This energy and ability to conquer circumstances which characterized the pioneers of one or two generations ago are still abroad in this great area and give to its operations a character of enterprise and effectiveness that are unsurpassed anywhere in America.

With the various tools provided by nature plus the capacity and resourcefulness of its people, Oklahoma has, undoubtedly, the opportunity for future industrial development unequalled by any other state in this country.

#### Industrial Future

Through the application of farm chemistry, agricultural products of the state can be used for the establishment of new industries. Science is remaking the farm and we are in the early dawn of a new era for agriculture. Recent developments of fact—not fancy—indicate that in the not distant future the aim of crop rotation will be not to curtail production but to increase it to meet the grow-

(Continued on page 186)

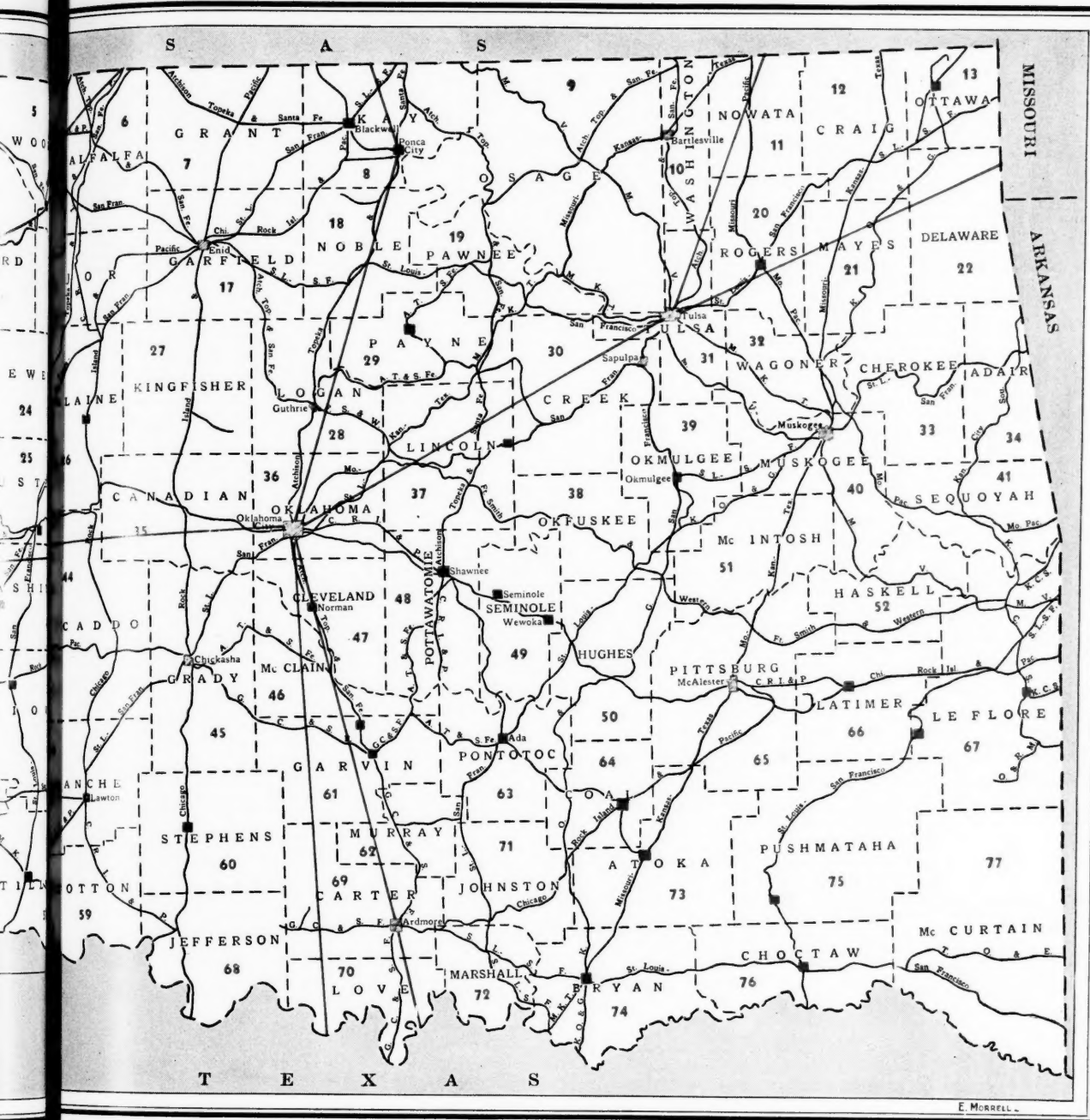




Top—Next to petroleum refining, meat packing is Oklahoma's most important industry and this plant of Wilson and Company in Oklahoma City is but one of many such plants in the state. Center—Ranking as third largest industry with an annual output exceeding \$33,000,000 is the production of flour and other grain mill products: plants such as this grain mill and elevator at Enid are familiar sights throughout Oklahoma. Lumber and timber production is another important Oklahoma industry; this is one of several plants in the state belonging to the Dierchs Lumber Company.







Sand and gravel—5, 7, 8, 11, 19, 24, 27, 31, 33, 35, 36, 38, 40, 45 to 50, 54, 55, 57, 58, 61 to 63, 71

Sandstone—7, 10, 28, 51, 64, 65, 67, 73

Salt—5, 42, 53

Stone (miscellaneous)—54, 55

Tripoli—13

Volcanic ash—3, 15, 32, 50

Lime—13

#### Agricultural Products

Corn—all counties

Cotton—6 to 9, 11, 12, 14 to 21, 23 to 77

Peanuts—10, 16, 29 to 33, 36 to 41, 44 to 50, 52, 57, 58, 60 to 71, 74 to 77

Soybeans—11 to 13, 19 to 22, 25, 30 to 32, 39, 40, 51, 63, 67

Sweet potatoes—1, 4 to 58, 60 to 77

Some flax, sugar cane and tobacco is also grown in addition to other farm crops

#### Timber

Loblolly-shortleaf pine—13, 22, 34, 41, 65, 66, 67, 73, 75, 76, 77

Oak and other hardwoods—4 to 41, 43 to 52, 55, 57 to 77

Natural gas is available for consumption in the following counties: 2, 5 to 21, 23 to 32, 35 to 76

— Railroads

— Airlines

■ Airports—also at principal cities printed in red

# Oklahoma—

## Its Wealth of Resources Offers Many Industrial Opportunities

**O**KLAHOMA was, with the exception of a small area ceded to the United States by Texas in 1850, originally a part of the area included in the Louisiana Purchase of 1803. At an early date much of the land was set aside as the Indian Territory in which large tracts were granted to the Five Civilized Nations of Cherokees, Creeks, Seminoles, Choctaws and Chickasaws. The remaining portion formed Oklahoma Territory and was so designated in 1890. Following the Civil War a considerable part of the Indian land was transferred to the U. S. Government at an average price of less than twenty cents an acre. Of this area certain tracts were then ceded to other Indians with the original stipulation that white settlers should be forbidden. This latter met with stubborn resistance by a group of white people from surrounding regions and more than once U. S. troops were required to eject the intruders before in 1889, after four years of negotiations with the Indian tribes, the first vacant lands of over five million acres were thrown open for white settlers. In subsequent years some seven million acres more were opened. The drive for statehood commenced as early as 1892 but it was not until 1904 that the first bill appeared in the House of Representatives. The following year another bill made its appearance but it too failed to become law, largely because the attempts were aimed at separate statehood for the two territories. Finally, in 1906 a bill was introduced providing for joint statehood which met with approval and Oklahoma became a State of the Union on November 16, 1907. The various Indian tribes still retain nearly twenty million acres.

With an estimated population of 2,548,000 in 1937, Oklahoma ranks 21st among the States. It is 17th in size with 70,057 square miles of which 69,414 is land area, only 643 square miles being water area.

### Climate

**A**LTHOUGH the eastern part of Oklahoma is essentially agreeable for living and exceptional so far as agriculture is concerned, the western section of the state has marked differences of climate, particularly with regard to precipitation which is quite adequate in the southeast but declines to an annual average of only about 18 inches in the north and west. The annual average rainfall for the entire state is about 37.76 inches with 75 to 80 percent falling during the 210 day growing season between March 1 and October 31. Snow which averages only a few inches annually seldom lasts for more than a few days. With short mild winters the summers are correspondingly long with warm temperature but the climate is dry and the nights are nearly always cool. The annual average temperature of 61.6° Fah., varies throughout the state from 54° Fah., to 65° Fah.

### Transportation

**O**KLAHOMA, the youngest of the Southern states and the second largest, has extensive and well distributed transportation systems. The railroads, operating a total mileage close to 7,000 miles, provide adequate passenger and freight service to virtually every one of the State's seventy-seven counties. Of the total mileage, all but a few miles are operated by twelve Class I roads which provide trunk lines from East to West and North to South.

With the increased use of trucks and busses for freight and passenger conveyance, highways are an important factor in the State's progress. The total mileage of Oklahoma's state highway system at the close of 1939 was in excess of 8,300 miles, made

up of approximately 3,300 miles of hard surface roads, 3,700 miles of treated and untreated gravel roads and only about 1,300 miles of dirt roads.

Though Oklahoma has a network of rivers, water transportation has been limited to shallow draught vessels, but projects are under way to make part of the Arkansas and Red rivers navigable for a limited distance. When this is completed, access can then be made for direct shipments to Gulf Coast ports.

In the matter of air transport Oklahoma is well provided with main line service directly to, or connecting with, virtually every part of the country.

### Manufactures and Finance

**A**CCORDING to the latest figures released by the Bureau of the Census, the value of Oklahoma's manufactured products in 1937 amounted to \$366,088,721, an increase of \$85,412,506 over the 1935 total of \$280,676,215. The industry which ranked first in value of manufactured products in 1935 (figures for 1937 are not yet available) was petroleum refining with \$106,689,449. Most important among the other twenty one industries listed with a value exceeding one million dollars was meat packing, \$37,356,642; flour and other grain mill products, \$33,983,590; butter, \$11,812,505; oil, cake and meal from cottonseed, \$5,727,340; glass, \$5,594,975; and zinc smelting and refining, \$5,245,884.

The total payroll in 1937 for all industries amounting to \$34,390,477 was distributed among 29,551 employees in 1,428 establishments. Cost of materials, fuel, electric energy and contract work was \$255,470,399.

The extent of decentralized industry in Oklahoma is evident from the fact only one of the state's 77 counties is without a manufacturing establishment.

The total deposits held by 396 banks reporting to the Comptroller of the Currency on June 1, 1939, was \$458,921,000 of which \$364,102,000 and \$88,926,000 was demand and time deposits respectively. Capital stock including capital notes and debentures totaled \$28,580,000. Total assets were \$516,548,000. Oklahoma bank clearings as represented by five reporting exchanges in 1939 amounted to \$696,509,000. The total internal revenue collected during the calendar year 1939 was \$56,254,297, the income tax receipts alone accounting for \$17,007,399.

### Agriculture

**T**HE total cash farm income in 1939 amounting to \$193,301,000 placed Oklahoma fourth among the Southern states and was an increase of \$12,875,000 over the comparable figure for 1938. Of this total cash farm income, \$71,912,000 was derived from crops and \$93,658,000 from livestock and livestock products.

Among crops, wheat was the most important and the cash income of \$31,002,000 from 4,317,000 acres yielding 60,438,000 bushels was the largest in the entire South. The production of 520,000 bales of lint cotton from 1,772,000 acres yielded a cash income of \$22,445,000 while from cottonseed was derived an additional \$3,025,000. Another important crop is oats, of which 21,114,000 bushels were produced.

Oklahoma also produces a large quantity of other farm crops such as corn, peanuts, sweet potatoes, etc., suitable for commercial use but, in addition, there have been grown or are growing in the state an extensive variety of plants from which well over fifty different drugs are obtained, many of them being quite rare.

In 1939, the total number of horses, mules, sheep, swine and cattle numbered 4,359,000 and was valued at \$109,623,000 of which more than half consisted of cattle numbering 2,247,000 with a value of \$69,959,000. The total yield of \$21,750,000 from milk and milk products, \$7,706,000 from eggs and \$3,220,000 from chickens gave a cash farm income from dairy produce of \$32,676,000.

## Timber

**A**LTHOUGH Oklahoma often is regarded as a prairie state, a considerable area of native forest land extends from the Southern pine region of the southeast to the western boundaries of the state where post oak and some other types prevail.

In 1936 the U. S. Forest Service estimated the forest area of eastern Oklahoma at 4,200,000 acres including 1,900,000 acres in saw timber areas, supporting the principal part of the total stand of four billion board feet in the proportion two-thirds hardwood and one-third softwood. More recently Ernest L. Little of the National Farm Chemurgic Council has compiled a preliminary report of the state's forest area and resources. In addition, the U. S. Southern Forest Survey has completed a survey of the extreme southeast.

According to Mr. Little's report, approximately 12,000,000 acres are designated as forest land, part of which still is virgin forest. The largest portion, comprising about 6,000,000 acres are of the Black-jack post-oak type. The most important commercial type is shortleaf pine-oak and covers some 4,000,000 acres. The remaining 2,000,000 acres are of the oak-hickory type.

The number of trees indigenous to Oklahoma is 134, the majority of which are hardwoods and include black walnut, hickory, beech, birch, oaks, elm, sycamore, and basswood. The softwoods consist of shortleaf pine, red cedar, western yellow pine and some loblolly pine.

The area covered by the U. S. Southern Forest Survey, embracing five counties, was 4,026,200 acres. Of this area nearly 75 percent is forest land and contains 2,514,200,000 board feet of sound pine or 8,000,000 cords, including under-sawlog size trees. Pure upland and river bottom hardwoods are found on 1,577,200 acres; hardwoods mixed with pine on 686,300 acres; and pure stands of pine on 697,500 acres.

## Minerals

**O**N the accompanying map appears an outline of the chief commercial development of mineral resources in Oklahoma. Some minerals, such as gypsum, volcanic ash, caliche, clays, limestones plus others, are present in great abundance over a much wider area than indicated on the map showing areas of production.

In addition, the following materials are known which are not being utilized commercially at present:

Magnetite and hematite in Comanche and Kiowa Counties. Some low grade hematite ores have been mined. Extent of magnetite and hematite deposits are not fully known, but recent studies indicate magnetite at least to be more extensive than formerly believed.

Wool rock is available in several sections of the state as a result of recent research by the Oklahoma Geological Survey.

Kaolin clays of commercial importance have not been utilized in Oklahoma, but recent analyses of samples from Kiowa, Le Flore and McCurtain Counties indicate the presence of these clays. Additional research will be required to demonstrate their value.

Grahamite was formerly mined in Atoka and Pushmataha Counties, and considerable quantities of the material are known in these and adjacent counties.

Dolomite deposits of Oklahoma have not been extensively utilized for the technical and special uses of the mineral although large deposits of high grade are present in the Arbuckle Mountain area in Johnston and Murray Counties and beds of dolomitic rock are present in several western counties.

Manganese has been known in the Arbuckle Mountains for many years and during the last World War, several cars of ore were shipped from the vicinity of Bromide, Johnston county. Manganese also has been reported from the Ouachita Mountains of southeastern Oklahoma.

Coke for domestic use was made extensively in Oklahoma before the advent of natural gas as domestic fuel but it is not now being made. The manufacture of metallurgical coke to supply the foundries located in the southwest, and the utilization of by-products, offer important possibilities that should be thoroughly investigated.

In addition to dolomite, there are possibilities of fire clays in association with coal beds, and considerable quantity of novaculite and other silica materials which offer possibilities as refractories.

Brines: Oil field brines are going to waste in the large oil producing areas of Oklahoma, and brines from deep wells can be obtained in most all part of the state. Some use has been made of these brines in the manufacture of chemicals, and during 1934-1935, Oklahoma ranked second in the nation's production of magnesium salts and calcium-magnesium chloride, made from brine. Sulphuric acid is now being manufactured at Bartlesville, Washington county, which, with an abundance of limestone and brines, offers possibilities for a chemical industry.

Phosphate nodules and rock are found in a few areas, and a number of deposits of phosphatic limestones which may have value for agricultural purposes are known.

Barite is found in various forms in Oklahoma; as sandbarite crystals in central Oklahoma, barite nodules in south-western Oklahoma, and a deposit of barite ore is reported from the Arbuckle Mountains.

Zircon crystals are found in a small area in the Wichita Mountains, and with the increasing demand and value of zircon for metallurgical purposes a closer search for commercial quantities of the mineral may be justified.

## Electric Power

**E**LECTRIC power facilities, which are available throughout the state, consist of 106 plants with a total generating capacity of 366,018 kilowatts. There are 29 steam power plants with a capacity of 316,605 kilowatts, 74 internal combustion plants capable of 47,794 kilowatts, and 3 hydro-electric plants with a rated capacity of 1,619 kilowatts. The network of connecting interstate transmission lines assures an adequate supply of power to meet unforeseen demands.

Production of electric power in 1939 by public and private plants totaled 1,111,804,000 kilowatt hours, an increase of 49,889,000 kilowatt hours over the previous year. Of this amount 1,110,503,000 kilowatt hours were produced from fuel operated plants and only 1,301,000 kilowatt hours originated from hydroelectric plants.

## Taxation

**O**KLAHOMA state taxes as they apply to industry at the present time consist principally of three items. The first of these is the corporation income tax of six percent. The second is the franchise tax levied on all domestic business corporations based on the amount of capital stock issued and outstanding in January of the preceding year, the rate being \$10 on \$5,000 or less and \$1.00 per \$1,000 on all excess up to \$50,000. Beyond this amount and up to \$100,000 the rate is \$1.00 per \$2,000, with \$20 for a further excess up to \$250,000. Over \$250,000 there are similar levies for additional increases ranging up to \$100 for each \$5,000,000 excess over \$10,000,000. Foreign corporations are levied at the rate of \$25 for every \$50,000 up to \$500,000 of capital employed within the state. Over \$500,000 but not exceeding \$5,000,000 there is an additional levy equal to 1/40 of one percent on the excess; over \$5,000,000 the additional amount is at the rate of \$30 for each excess million.

Finally, there is a gross production tax on asphalt, ore bearing lead, zinc, jack, gold, silver, copper, petroleum, natural gas and casing-head gas at the rate of three percent on gas and oil, and half of one percent on other minerals.

The assessed value of all taxable property in 1939 was \$1,201,511,365.

## Labor and Wages

**W**ITH a density of 34.5 persons per square mile, the population of Oklahoma is fairly evenly distributed, though the petroleum industry has tended to draw more people within its areas than elsewhere. Oklahoma in 1930 had only two cities with a population exceeding 50,000, Oklahoma City in 1940 has 204,517 and Tulsa in 1930 was approaching 150,000, the latter city having doubled its size in the decade between 1920 and 1930. The rural population still comprises the major classification with 65 percent. The total native born white population is 98.7 percent of which 93.9 percent are American born of American parentage.

Throughout the state there is a plentiful supply of labor both skilled and unskilled with rates of pay varying, with the community and type of industry. In conformity with the Wage and Hour law the minimum rate for unskilled work is 25 cents per hour. In Oklahoma City, unskilled labor ranges from 25 to 50 cents, the latter being the prevailing rate paid by the packing industry. Semi-skilled pay varies from 38 to 55 cents while skilled labor rate of pay ranges from 55 to 98 cents an hour with exceptions in some of the technical industries where the average may be \$1.20 or over.



## Oklahoma, an Important Center of the Southwest

(Continued from page 180)

ing demands of industry for organic things that grow from the soil. Oklahoma produces a large majority of these organic products that can be utilized in the establishment of new industries. Cotton, cottonseed, lint, corn, sweet potatoes and many others are now being utilized in the manufacture of better things for better living. During the past two years extensive test plantings of new crops have been made throughout the state and results to date indicate that many of these crops can be successfully cultivated, particularly those producing vegetable oils so vital to many industries. Essential oils, obtained from agricultural products, formerly imported from abroad, can also be grown, thus providing additional agricultural income and use for idle acres. All of these will require primary processing industrial plants, thereby increasing industrial activity and payrolls.

The second tool, forest resources of the state, can also be used for the further development of industrial payrolls. The late Dr. Herty found the way to manufacture paper of various kinds from short leaf pine which grows in the southeastern part of the state. Work has already been started to determine the possibility of the successful operation of a paper mill. The by-products from this mill and others could be used to manufacture many other products.

The third tool, mineral resources, can provide for many new industrial plants. Rock wool can be made from limestone, using natural gas in the furnaces; clays can be processed to be used for bleaching and clarifying of lubricating oils; asphalt for the manufacture of roofing; and volcanic ash for concrete mixtures, floor sweeps and scouring powders. The coal resources could be used to manufacture coke, dyes and perfumes and many other products. Salt from springs and oil field brines could be utilized by the chemical industry. From salt are made hydrochloric acids, various types of alkalies and many other products. Oil field brines also yield magnesium, iodine, bromine and other valuable substances. Oklahoma has deposits of over twenty kinds of granite. From a geological

construction and monument viewpoint, Oklahoma granite is equal to any other granite produced in the entire United States.

### Transportation

In the study of the possible future economic and industrial development of any section, certain basic factors that are vital for expansion should be taken into consideration. These factors include transportation facilities, power, available labor, and ideal living conditions, all of which are obtainable in Oklahoma.

In Oklahoma every section of the Great Southwest is reached by direct rail lines radiating over the state and many of the national railway systems maintain divisional headquarters, both freight and passenger, within the state boundaries. Federal designated highways intersect the entire state, including transcontinental routes, in addition to a state highway system providing transportation to every community. Bus and truck lines, operating under the jurisdiction of the Corporation Commission of Oklahoma, provide first direct day transportation and store-door delivery service to 312 communities. Through direct connections with other lines, they also serve a large number of more distant points with schedules supplementing those of the railroads and reaching many communities without direct rail connections. Several airlines are also in operation in every direction daily with airports in the principal cities.

### Fuel and Power

The primary sources of power and fuel are tremendous, with the largest high grade oil and gas fields in the world immediately nearby. The entire state is supplied with natural gas; this being the only state which uses no manufactured gas. This gas is gathered and distributed by a few distributing concerns and prices are practically uniform over the state. Fuel oil is largely a by-product of the refining process and is available in immense quantities. It is drawn mostly

*One of the South's large cotton growing states, Oklahoma's production of this staple crop is the basis of a thriving cottonseed oil, cake and meal industry of which the Chickasha Cotton Oil Mill at Chickasha is an outstanding establishment.*

from the refineries operating in the oil producing areas, the cost varying with the market of petroleum. The supply of coal in the field stretching from Coalgate through the McAlester area to the Henryetta fields on the north is, for all purposes, unlimited. Electric power is supplied throughout the state by several major systems, thereby assuring adequate and continuous service at reasonable rates.

• • •

Labor conditions in Oklahoma are unusually satisfactory. There is an abundant supply of skilled and unskilled workers, both male and female, available at wages comparing favorably with other industrial states. Labor turnover is normal and the workers have both the ability and inclination to do difficult operations well with a minimum of supervision.

Considered from any angle, living conditions are ideal. In climate Oklahoma is neither a northern nor a southern state, being in that delightful borderland between the cold of the rigorous winters of the north and the sustained and vitiating heat of the extreme south. It has well been said that Oklahoma has just enough winter to relieve the monotony of a year-round summer. Homes, as a rule, are not pretentious, but they are substantial and modern in design. Rentals are very reasonable. Educational facilities, leading from kindergarten through the university, provide training in almost every line, and the standards of the state's universities attract students from the entire country.

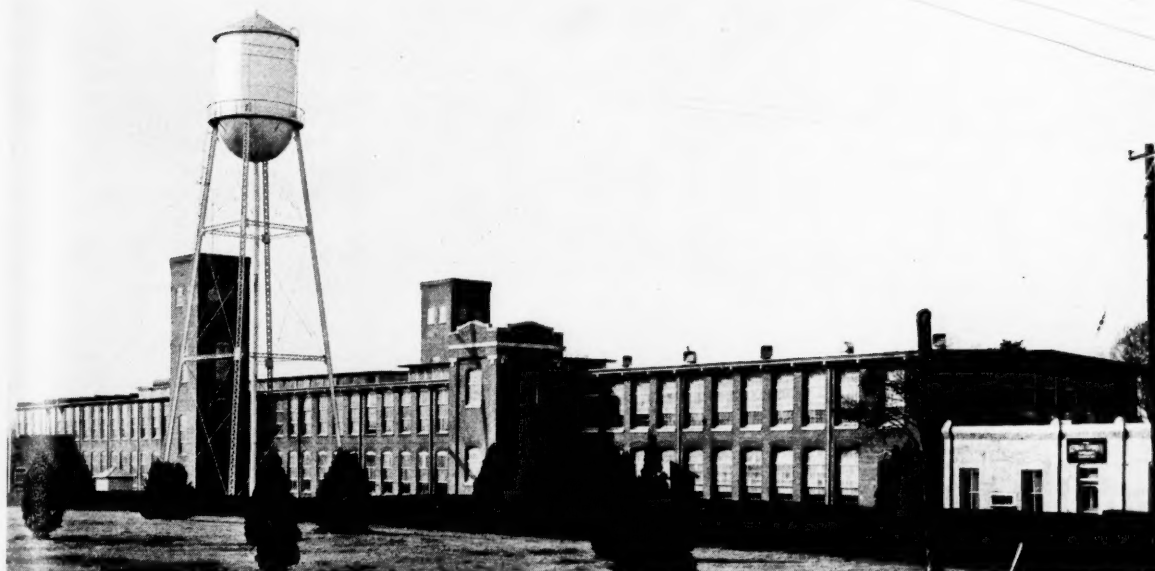
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Here are the materials out of which is being built an empire. No other area of the United States of similar geographic compactness and with similar homogeneity of population and internal relations has so great a variety of equal abundance of these natural resources upon which the prosperity of a people must be based. Industrially, its development has already begun; the next quarter of a century is certain to see an industrial growth here which will be one of the outstanding events of our national life.

\*NOTE: For some years the author was manager of the Industrial Division of the Oklahoma City Chamber of Commerce and the Oklahoma Farm Chemurgic Council.



# SOUTH CAROLINA



*The Addison plant of the Kendall Company at Edgefield is but one of the many textile mills in South Carolina which have made that State renowned for its cotton textiles.*

## NEW HORIZONS FOR SOUTH CAROLINA

BY

H. M. Pace and South Carolina Planning Board

**S**OUTH Carolina is vitally concerned in the upbuilding of industry and commerce. This state is a part of the vigorous, forward looking, forward moving New South, and a real frontier for the aggressive industrialist, investor, agriculturist and home-seeker.

South Carolinians are determined to bring about greater diversification of industry and the development of enterprises by home folks for the utilization of more of the products of her mines, forests, fields and streams.

No other state in the South surpasses South Carolina in advantages for diversification of industry and the process is well underway. Electric power is available in all parts of the state, splendid highways connect hamlets, villages, towns and cities, there is an abundant supply of intelligent homogeneous labor, and markets right at home for a large number of products. Of great importance to the industrialist is the fact that in South Carolina today, there is a growing spirit of community and state cooperation and dependable concurrence in all matters beneficial to industrialists, investors, and new and old citizens. The new spirit and attitude augurs well for the future.

The people of the state are definitely and keenly interested in negotiating with manufacturers who are realizing more and more the advantages and necessity of locating new plants, relocating obsolete plants, or establishing branch plants in the South to adequately serve the fast growing markets of the South and Southwest, the West Indies, Central and South America.

South Carolina occupies a strategic position because it combines the advantages of low cost production and accessibility to supplies and markets.

Some other advantages of plant location and operation in South Carolina are: deep water ports, excellent plant sites from the mountains to the sea, lands are cheap, construction costs are low, there is a plentiful supply of native labor, generous rainfall, an abundant supply of electric power in all parts of the state and splendid water resources.

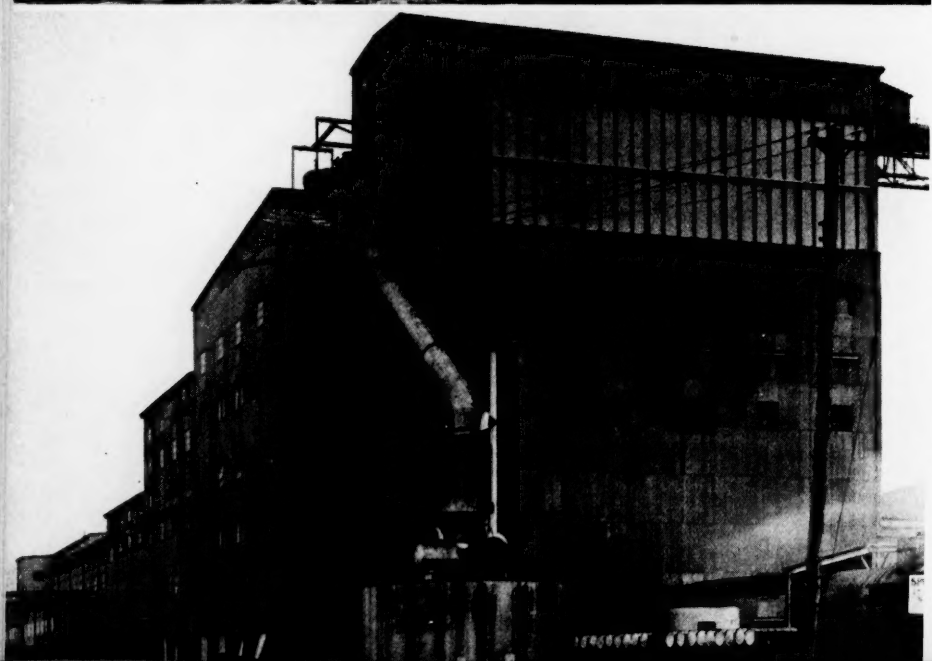
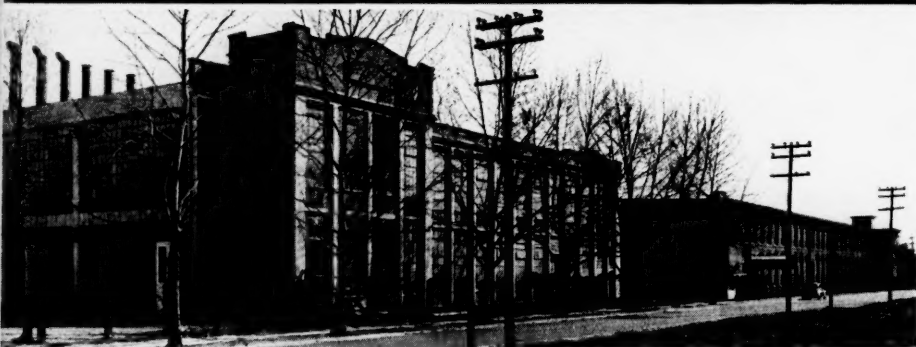
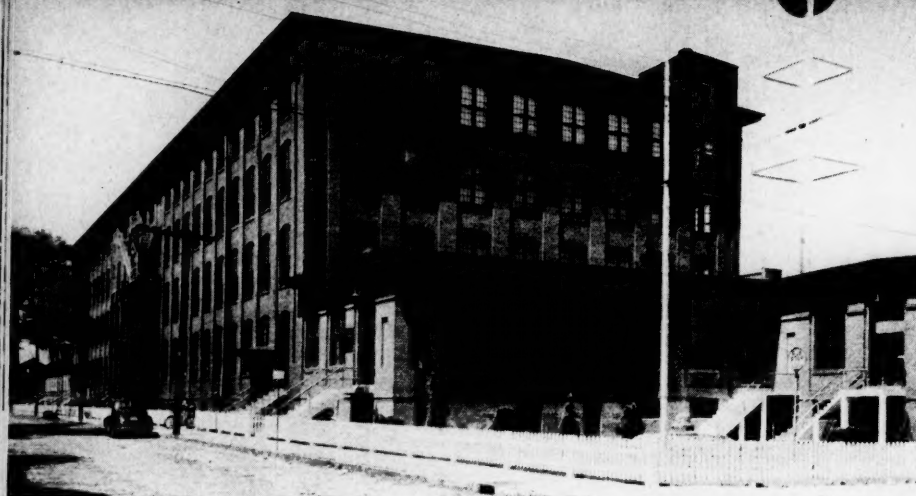
Here will be found comfortable living con-

ditions, complete rail, water, highway and air transportation facilities, well rounded educational and cultural opportunities and unmatched recreational facilities.

Other important factors which contribute to low cost production are: mild and equable climate, no extremes of heat or cold, low heating cost in winter, low cost electric power, reasonable labor costs, out of doors work practically the entire year.

### Some Raw Materials, Natural Resources and Their Uses

Recent geological and other studies have emphasized some of the possibilities of plant location and development in relation to raw materials now available or which are readily obtainable the world over. South Carolina stands high in its agricultural and forest resources. With a long growing season agriculture can produce an abundant supply of grains, potatoes, vegetables and other crops for chemurgic industries and canning plants. Great areas of the state are devoted to forestry. Intensive educational effort is underway to protect the forests from fire and to encourage reforestation on a large scale. Pulp mills and wood using industries are assured of a continuing supply of hardwoods, softwoods, and



pulpwood.

Clays suitable for brick, tile, terra cotta, pottery and aluminum are available in several counties. Kaolin for filler for paper and paint, for porcelain and chinaware and other ceramic products is available in Aiken, Richland and Lexington counties in almost unlimited quantities. Large deposits of high grade limestone have been found in Orangeburg, Berkeley, Florence and Calhoun counties, and this material is encouraging thought as to the development of industries making cement, agricultural lime, building lime, carbon dioxide, and calcium carbide. Marl deposits in the coastal plain can be used for making cement, cyanamid, synthetic derivatives, calcium carbide, and other products. Phosphate rock in the coastal area can be used for fertilizer, phosphoric acid and by-products. Peat deposits in the area between the Ashepoo and Edisto Rivers near the coast can be used for making fertilizers, disinfectants, dye, ammonia and alcohol.

Sand suitable for glass making is available in Williamsburg, Colleton, Lexington, and Richland counties. Granite for building construction is available in Fairfield, Chesterfield, Edgefield, and Richland Counties.

Other plants which the state is interested in developing, as here is a promising field for them: From agricultural products: acids, alcohol, and methane, automobile tires, chemicals, new cotton products, cold storage, dairy products, fabrics, feed products, flour and grain milling, frozen foods, garments, hosiery, meat packing, poultry and eggs, sausage casings, soap, starch and tobacco processing.

From forestry products: acids, building material, cellulose, chemicals, soft wood products, hardwood products, matches, paper, paper products, plastics, pulp, rayon, roofing, rosin, textiles, woodworking.

From mineral resources: acids, chemicals, electro-chemical products, paints, soap, sodium hydroxide.

From other products: batteries, building hardware, mill supplies, sheet metal work, woolen and rubber products.

#### Recent Developments

During the past few years encouraging changes have taken place in the industrial economy of the state. Pulp and paper mills were established at Charleston and Georgetown, a paper cup plant at Darlington, meat packing plants at Walterboro and Orangeburg, a large box factory at Greenville, a

*South Carolina though primarily an agricultural state, nevertheless supports a growing number of industries whose total products are valued annually in excess of \$400,000,000. The diversity of these manufactures is illustrated by these pictures of (top to bottom): The American Tobacco Company's cigar plant at Charleston which is one of the largest of its kind in the South; a kaolin clay plant in Aiken County; the General Asbestos & Rubber Company, division of Raybestos Company at Charleston; the Maybank Fertilizer Company plant at Charleston; and the West Virginia Pulp and Paper Company mill at Charleston.*



cheese plant and biscuit plant at Greenwood, a cyanamid plant at Georgetown, garment factories in Greenville, Greenwood, Saluda, Spartanburg, Sumter, Union and York Counties, a furniture plant at Sumter, seafood and vegetable canning plants in Beaufort, Charleston and Georgetown and other counties, a wood specialty plant at Charleston, a lime

#### The State's Leading Industries\*

	Number 1939	Average No. Employees 1939	Value of Mfg. Products 1939
Textiles .....	233	89,378	\$239,842,159
Lumber and Timber .....	228	8,678	17,713,210
† Electric Power .....	41	1,112	16,198,350
Fertilizer .....	55	1,732	12,739,934
Pulp and Paper .....	3	1,429	10,125,984
Clothing .....	22	3,019	7,388,572
Oil Mills (cotton) .....	30	886	7,042,816
Minerals and soda water .....	81	819	7,006,006
Barrels, baskets, and veneer .....	36	2,996	5,187,887
Printing and publishing .....	143	928	4,877,332

plant at Holly Hill, a plant to make specialized textile products in Aiken County, and textile supply plants in several Piedmont counties.

According to the report of the Commissioner of Labor for South Carolina for 1939, there were in the state 1,421 industries of all kinds employing altogether 126,297 persons, with payrolls of \$88,365,782, and manufactured products valued at \$382,290,041.

South Carolina ranked seventh in the United States in installed water power capacity at the end of 1939 with 488,240 K.W. Additional generating capacity of approximately 180,000 K.W. is now under construction. Other installed generating capacity—steam power plants 8—125,130 K.W. Internal combustion engines 6—3,163 K.W. Combination of two or more types 2—17,590 K.W.

The manufacturing plants of the state are now turning out a wide variety of products including asphalt, asphalt emulsion, bakery products, baking powder, barrels, baskets, veneering, brick, tile, carbonated beverages, ice cream, concrete products, chemicals, clothing, confections, coffins and caskets, cheese, fertilizer, flour, feed and grist, food products, foundry and machine work, furniture, furniture parts, woodwork, ice, lumber, mattresses and springs, monuments, cotton seed oil, paint, varnish, naval stores, pulp and paper, pottery, patent medicines, paper cups, paper products, publishing and printing, textiles, shipbuilding, textile engraving, textile supplies, brooms, cigars, wood creosoting, signs, oil refining, cotton waste, glass, truck bodies, etc.

From the mines of the state are coming granite, gold, clays, sand, silica, limestone, building stone, crushed rock and gravel.

Products of the farms are going into meat packing plants, creameries, cereal plants, and vegetable canneries. From the ocean, bays, rivers and sounds increasing quantities of seafood is being taken, processed and canned each year.

\* Source—S. C. Dept. of Labor Report, 1939.

† From Manufacturers Record and other reports.

#### Constructive Work Now Under Way

Business, educational, administrative and legislative leaders have been conducting studies to determine what might be done to make the state more attractive to investors, new citizens, and industrialists. Investigations have been made of industrial development fundamentals, the taxation situation, avail-

able raw materials, labor supply, transportation facilities, legislative and community attitude, legal problems, and thought is being given at this time to holding a state constitutional convention to bring about reorganizations of the state government and its subdivisions for more efficient and economy.

The State Planning Board has just released a comprehensive study of the Fiscal System of South Carolina and has assembled a mass of data relating to industrial resources and advantages.

The State Council of Research, composed of economists and specialists associated with universities and colleges of the state, and business men, has also been doing research relating to specific subjects.

The Charleston Industrial Bureau, one of the active organizations in the state has been collecting facts relating to handicaps and suggesting needed changes in laws to make the state more attractive to industry and the investor.

In the latter part of 1939 a committee of the Charleston Chamber of Commerce made a tour of some of the principal cities of the state and conferred with business and professional leaders about economic and legislative problems. Subsequently representatives of all Chambers of Commerce of the state met in Columbia and formed a committee to confer with and work with administrative and legislative leaders of the state in their efforts to improve conditions for the better.

The College of Charleston held a Community Development Institute and offered a series of original courses in civic leadership and applied social science June 22 to July 6, 1940. This institute, sponsored by the South Carolina Public Service Authority and the Charleston Industrial Bureau, will give civic leaders an opportunity to study practical methods for creating greater opportunity for their local people.

Governor Burnet R. Maybank, a business man, in his inaugural address in 1939, said, "I promise to use the office of Governor to the limit of my ability to give South Carolina four years of business-like government . . . The very cornerstone of good government is a sound fiscal policy. . . Let us face the facts as they really exist. . . One of our jobs is to sell what we have to the nation."

Subsequently, he has emphasized the necessity for statewide thinking and cooperative effort about the economic and legislative problems now confronting the state.

Leaders in South Carolina believe that the state has turned the corner—that better days for industry are ahead.

## Charleston Offers Opportunities for New Industries

Manufacturers of almost every commodity consumed within the United States, or exported to foreign countries, are realizing more and more each year the many advantages offered by the Southern states for the location of new plants, relocation of obsolete plants, or for the establishment of branch plants to adequately serve the fast growing markets of the Southeastern states, as well as those of Central and South America.

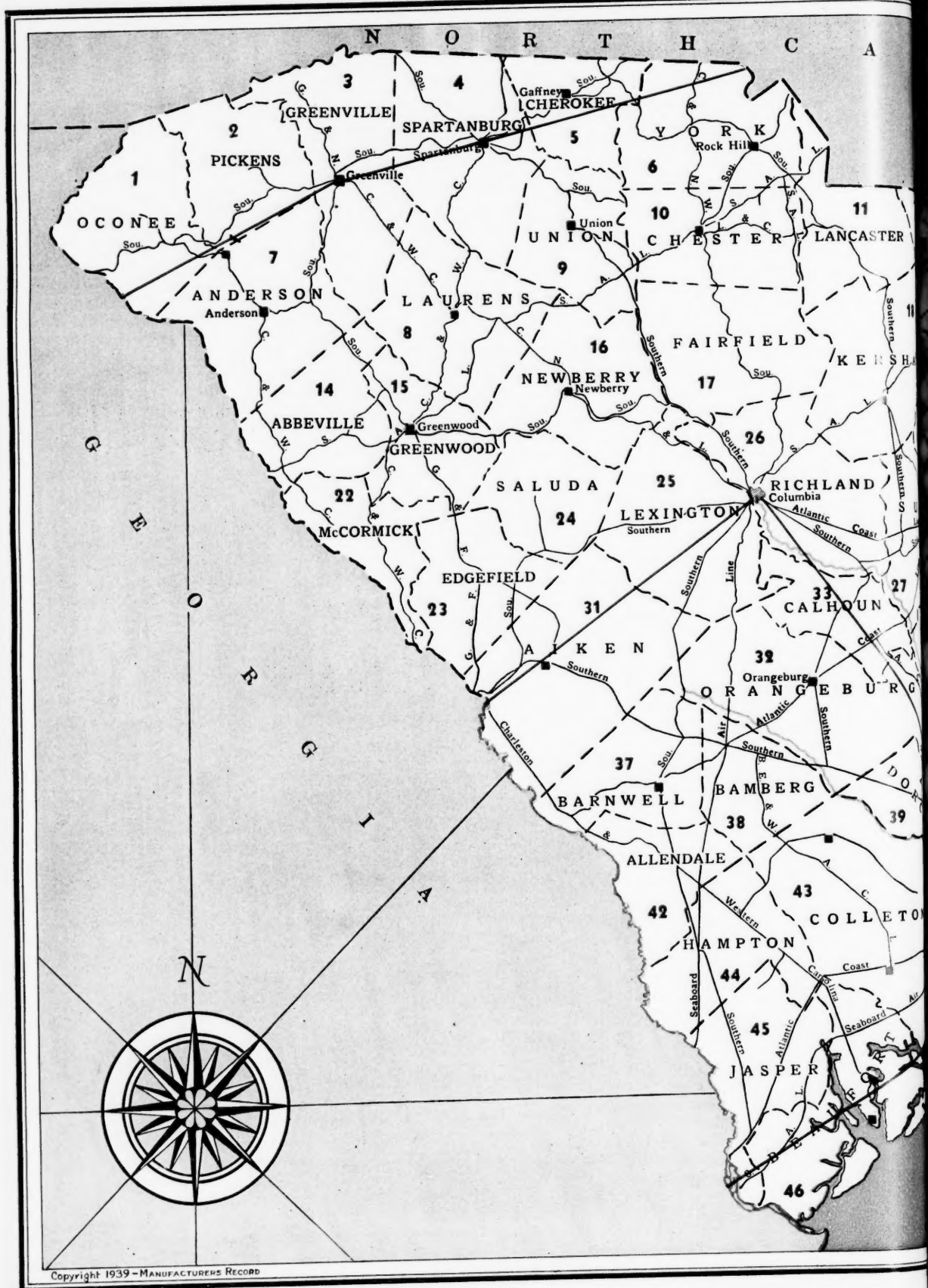
Charleston, South Carolina, the most strategically located deep water port on the entire South Atlantic coast, is the one city that combines all of the advantages of accessibility to supplies and markets, mild equable climate, abundant fresh water for manufacturing purposes, unlimited power at low cost, complete transportation facilities and excellent factory sites.

There are at this time in the Charleston area many ideal factory sites available or convenient to deep water, rivers and waterways, railroads and highways.

The Charleston Industrial Bureau, a permanent body of leading business men, does not offer unusual inducements, subsidies, bonuses or gratuities to obtain new plants, nor does it make excessive or exaggerated statements about the opportunities and advantages of this area. It presents authentic facts and information to inquiring industrialists with the assurance of favorable community attitude, and reliable and dependable concurrence in all developments mutually beneficial to industries and to the citizens of Charleston County.

The Bureau's industrial engineer will prepare carefully, upon request, a special survey answering any questions and containing authentic facts and figures applying to any particular manufacturing business and problem. An outline of requirements, type of business, etc., addressed to the Bureau will mean that a survey will be prepared immediately. All negotiations are held strictly confidential. No publicity of any sort is ever released about any project without consent of the officers of the prospective enterprise.

**CHARLESTON INDUSTRIAL BUREAU**  
50 Broad St. Charleston, S. C.



# SOUTH CAROLINA

Its principal raw materials and transportation facilities, with facts on the reverse side pertaining to its industrial growth and opportunities for industry.

*Mineral Counties in which mineral is commercially produced*

**Barite**—5  
**Clay (brick and tile)**—25, 26, 27, 39  
**Gold**—5, 6, 11, 12, 14, 22  
**Granite (crushed)**—3, 4, 8, 16, 17, 18, 23, 25, 26  
**Kaolin (sedimentary)**—25, 26, 31  
**Limestone**—5, 32, 33  
**Mica**—11  
**Sand and gravel**—2, 11, 12, 13, 25, 26, 31, 41, 43  
**Tin**—5  
**Vermiculite**—3

A small amount of silver is obtained as a by-product in the smelting of other ores.

## Timber

**Bottomland hardwoods**—12, 13, 18, 20, 21, 26, 28 to 30, 32, 34 to 36, 38 to 41, 43 to 45  
**Loblolly pine—hardwoods**—8, 9, 10, 12, 13, 15 to 34, 36 to 45  
**Longleaf pine**—11, 12, 18, 19, 20, 25, 26, 27, 30, 31, 33 to 45  
**Mountain hardwoods**—2  
**Shortleaf pine—hardwoods**—1 to 12, 14, 15, 17, 18, 22  
**Virginia pine—hardwoods**—2, 3, 4

**Naval stores**—12, 18, 25, 26, 28, 31, 32, 34, 36 to 40, 42 to 46

**Commercial fisheries**—30, 36, 41, 43, 46

## Agricultural products

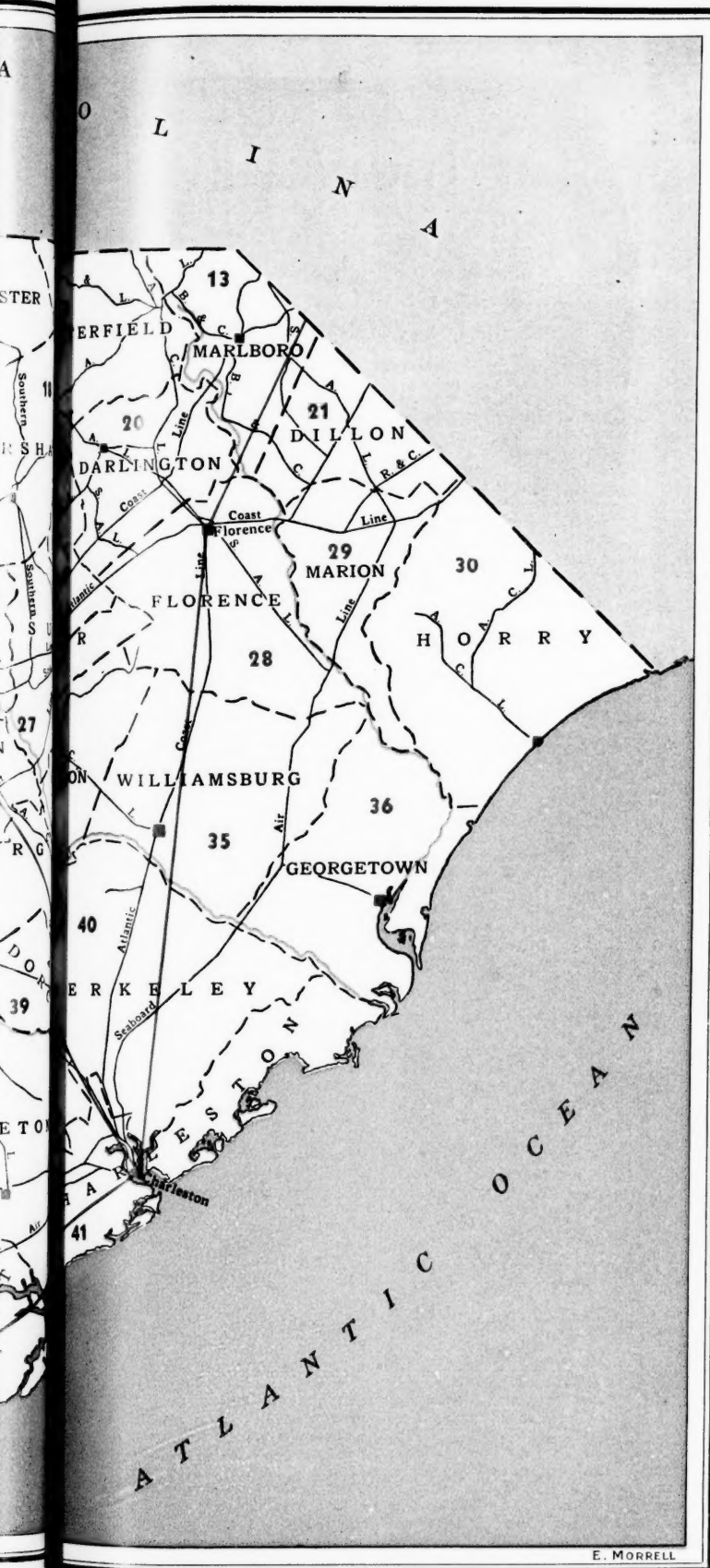
**Corn**—all counties  
**Cotton**—all counties  
**Peanuts**—7, 8, 11, 13, 16 to 19, 21, 23 to 26, 28 to 33, 36 to 46  
**Soy beans**—1 to 21, 23 to 46  
**Sugar cane**—19 to 21, 23 to 25, 27 to 35, 37 to 46  
**Sweetpotatoes**—all counties  
**Tobacco**—12, 18 to 21, 27 to 30, 32, 34 to 36, 38 to 40, 43, 46

— Railroads

— Navigable Rivers

— Airlines

■ Airports—also at principal cities printed in red





# South Carolina—

## Opportunities for Industrial Development

**S**OUTH CAROLINA—the Palmetto state and one of the original thirteen—though originally visited by the Spaniards about 1520, was first settled by a group of French Huguenots at Port Royal in 1562. However, their stay was brief for in 1563 they were massacred by invading Spaniards and the few who escaped returned to France. More than a hundred years then elapsed before the next settlement, for while the territory now comprising South Carolina was a part of the land granted by Charles I to Sir Robert Hath in 1629, a grant which he failed to utilize, it was not until 1663 that Charles II made a second grant of the region to the Lords Proprietors and increased the area in 1665 to include what is now the two Carolinas. It is interesting to note that almost from the beginning this entire area was governed as two colonies—Albemarle the north, and Clarendon the south, named for two of the Proprietors—and governed under a constitution formulated by John Locke. The first English colony was established at Charleston on the Ashley River by William Sayle and his followers in 1670. Ten years later the site was moved to the present City of Charleston.

To South Carolina belongs the distinction of having been the first colony to adopt a provisional constitution in 1776 and, with the exception of Massachusetts, contributed more money to the War of the Revolution than any other province.

Ranking 39th in size with a total area of 30,989 square miles of which only 494 square miles is water area, South Carolina ranks 26th in population which in 1937 was estimated at 1,868,000.

### Climate

**T**HE climate of South Carolina is sub-tropical, characterized by long summers and mild winters. The rainfall, which is fairly evenly distributed throughout the year, averages slightly over 48 inches for the state as a whole. July and August are the wettest months with an average of 5.87 and 5.75 inches respectively, while the driest months of October and November average 3.02 and 2.33 inches each.

The average annual temperature of 62.9° Fahrenheit ranges from 45.5° Fahrenheit average in January, to an average of 79.8° Fahrenheit in July. The first killing frost seldom occurs before the first week of November and the last frost usually takes place before April. The average growing season of 235 days ranges from 191 to 253 days.

### Transportation

**S**OUTH CAROLINA is well supplied with transportation facilities of a varied character. Passenger and freight railroad service is available in every one of the state's 46 counties and operates over more than 3,500 miles of track. Except in the immediate coastal and extreme highland Piedmont regions, there are few areas of the state where railroad facilities are not available within a radius of about 5 or 6 miles. Over 3,000 miles of the railroad trackage is operated by six Class I roads.

The state highways consisting of 7,490 miles as of July, 1939 of which 5,687 miles are hard surfaced, supports a well developed transportation system. In addition to a number of truck lines there are 12 companies operating bus lines for passenger and freight service including three major trans-continental lines.

Inland water transportation is available at present on the Savannah River to a point slightly above Augusta, Ga. Other rivers have been set aside for commercially navigable purposes and at least two rivers—the Peedee as far as Bennettsville, and the Santee as far as Columbia—have been projected, but are

not yet completed for commercial navigation. However, one company has already made arrangements for their own barge service for the transportation of pulpwood to their plant from the hinterland.

Charleston, South Carolina's principal ocean port, in normal times is served by 22 shipping lines beside 6 coastwise lines, and has 39 wharves and drydock, shipbuilding and repair facilities. Ships can pass from bar to berth in 30 minutes and entrance to the channel can be made by day and night. At no point is the channel less than 400 feet wide or 30 feet deep. Numerous truck lines and three railroads connect the port with all inland points. The value of all imports and exports through Charleston in 1938 was \$88,523,161 and included 1,724,599 tons of imports and 621,435 tons of exports.

The three commercial airline routes crossing South Carolina directly connect this state with virtually every part of the country, besides providing a rapid means of transportation to different points throughout the state. There are 28 airports and landing fields strategically located in South Carolina.

### Manufactures and Finance

**T**HE total value of South Carolina's manufactured products in 1937 was \$409,911,517, an increase of \$112,755,109 or nearly 38 per cent over the \$297,156,408 value for 1935. Among the industries separately listed by the census report, 23 have products annually valued in excess of a million dollars, the most important of which are: cotton woven goods, \$216,800,565; rayon broad-woven goods, \$25,125,646; cotton fabric dyeing and finishing, \$24,418,067; cotton yarn and thread, \$19,744,146; lumber and timber products, \$17,066,532; fertilizers, \$13,204,201; cottonseed oil, cake and meal, \$11,106,405; non-alcoholic beverages, \$5,605,170; and paper, \$5,169,636.

The cost of materials, fuel, electric energy and contract work utilized in the 1,193 establishments, each having an annual output in excess of \$5,000, was \$234,433,365, while the 129,748 wage earners had a payroll amounting to \$91,791,692. According to the State Department of Labor, the amount of capital invested in all industries in 1939 was \$393,762,649. Textiles ranked first with \$199,323,388; electricity was second with \$118,872,385; and pulp and paper third with \$18,270,735. Between 1935 and 1937 the number of establishments was increased by 72 and no county has less than six plants.

The aggregate resources of the 151 South Carolina banks reporting to the Comptroller of the Currency June 30, 1939, was \$157,944,000. Capital stock, including capital notes and debentures, amounted to \$9,460,000 while individual deposits totaled \$139,666,000. Bank clearings as represented by three reporting exchanges in 1939 were \$230,018,000. Total internal revenue collections for the calendar year 1939 were \$9,714,679.

### Agriculture

**A**LTHOUGH from a cash income standpoint manufacturing is the greatest contributor to South Carolina's economic life, agriculture still remains the largest employer with 52.7 per cent of the population. Cash farm income in 1939 amounted to \$115,121,000, representing an increase of nearly 15 million dollars over the previous year. Of this sum, \$77,761,000 was the cash income derived from crops grown on 5,086,000 acres. Cash income from livestock and livestock products was \$19,485,000. Cotton was the largest single crop and yielded 870,000 bales of lint from 1,218,000 acres and produced a cash income of

(Continued on page 194)

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The material in the maps and accompanying articles on the individual states and the South as a whole are a comprehensive study from which decisions may be reached to determine new or branch plant location, market data information, investments and industrial expansion plans.

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AGRICULTURAL & INDUSTRIAL DEVELOPMENT  
DEPARTMENT

**CAROLINA**  
POWER & LIGHT COMPANY  
RALEIGH, NORTH CAROLINA



## South Carolina

(Continued from page 192)

\$37,266,000 in addition to \$5,816,000 from 386,000 tons of cottonseed. Tobacco came second with 130,200,000 pounds from 140,000 acres yielding a cash income of \$19,009,000.

Other important crops are: peaches, 1,484,000 bushels; corn, 25,433,000 bushels; peanuts, 16,280,000 bushels; oats, 11,515,000 bushels; and sweet potatoes, 6,834,000 bushels. Truck crops brought an estimated income exceeding \$4,561,000.

Agricultural products noted on the map are also grown in small quantities in other counties. Besides those crops already mentioned, South Carolina produces a large quantity of pecans, strawberries, grapes, plums, pears, figs, apples and rough rice.

The number of livestock in South Carolina in 1939 was 1,260,000, valued at \$47,921,000, the largest proportion being cattle numbering 359,000 with a valuation of \$10,270,000. Dairy produce aggregating \$10,749,000 in 1939 included \$6,658,000 from milk, \$2,350,000 from eggs and \$1,741,000 from chickens.

### Fisheries

**T**HE five coastal counties of South Carolina, while comprising only about 187 miles of general coast line, nevertheless have a tidal shore line in excess of 750 miles and consequently are capable of supporting fisheries of a commercial character. The catch in 1938-9 included: 4,195,523 pounds of shrimp; 619,451 bushels of oysters in shell, 37,936 gallons raw shucked oysters, 21,676,164 ounces canned oysters; 19,690 shad; 15,116 gallons crab meat; and 6,530,000 menhaden.

There are many acres of natural clam, oyster and scallop beds which will be developed further upon completion of a survey to determine suitable bottoms with proper water salinity. The principal species caught are shrimp, oyster, shad, terrapin, sturgeon, clams and crabs. Large quantities of menhaden are caught under South Carolina license, but most of it is landed or shipped to adjoining states.

### Timber

**A**PPROXIMATELY 10,732,000 acres or 65 per cent of South Carolina's entire land area is in forest land. The total area of sound saw timber amounting to 10,692,000 acres, is made up of 7,802,000 acres of softwood and 2,890,000 acres of hardwood (including cypress). The total area of merchantable timber is 6,204,000 acres, of which 4,412,000 acres are softwood and 1,792,000 acres are hardwood. On this latter acreage the saw timber totals 29,757,000,000 board feet including 18,982,000,000 board feet of softwood and 10,775,000,000 board feet of hardwood. Among softwoods, old growth comprises about 25 per cent, while old growth hardwoods amount to almost 66 per cent. The average stand per acre is 4,706 board feet, or 4,065 board feet for softwood and 6,172 board feet for hardwood.

In the area of merchantable timber, Southern yellow pine comprises almost 90 per cent of the softwoods, while oaks, red gum, tupelo and black gum are the predominant species in fairly equal quantity among the hardwoods with a good quantity of yellow poplar included.

The total stand on the merchantable forest area on a cordage basis is estimated to be in excess of 120,000,000 cords, 65,000,000 cords of softwood and 55,000,000 cords of hardwood. The average stand per acre is 12.2 cords or 9 cords of softwood and 20.8 cords of hardwood. The present drain per year of 4,189,000 cords compares with the annual net growth of 4,314,000 cords.

During the past eleven years approximately 78,854,000 trees have been planted to reforest about 86,000 acres in South Carolina. In the 1938-39 season more than 11,077,700 trees have been shipped, adding over 11,000 acres more at the rate of 1,000 trees per acre.

The principal kinds of wood used in the manufacture of pulp and paper are Southern pine, gum, and yellow poplar.

Production of sawed lumber in 1938 totaled 587,804,000 board feet of which 446,348,000 board feet was softwood and 141,456,000 board feet was hardwood. The value of lumber and timber products in 1937 amounted to \$17,066,532, the cost of materials, etc., used therein being \$7,018,166 while the 11,015 wage earners employed in the 231 establishments engaged in the industry received \$5,254,946 in wages.

In addition to other forest industries, South Carolina also has a large naval stores industry, the production in the season 1939-40 being 8,788 50-gallon barrels of gum turpentine. On the accompanying map is shown those counties in which naval stores are produced, but this refers only to stills, whereas trees are tapped in nearly all counties except those in the northwestern section of the state.

## Mining and Minerals

**S**OUTH CAROLINA'S geological history is such that the occurrence of metallic mineral wealth is not likely to approach the quantity or value of non-metallic minerals.

Included among the non-metallics are barite, clay, mica, sand and gravel, and stone.

Barite, which is mined in Cherokee county, is used in the manufacture of lithopone and barium chemicals.

Clay, in commercial quantities, is found in many parts of the state suitable for brick and tile, while other clays can be used in the manufacture of pulp and paper.

Granite in both slab and crushed form is available in many counties, as also is sand and gravel.

Spodumene and ryanite are found in the state and production may be possible after further exploration, while prospecting and development work on rock phosphate deposits which have been proceeding for the last two years may also have satisfactory commercial results.

Both lode and placer production of gold is carried on with both silver and copper also being recovered. During 1938 production of gold amounted to \$373,500, most of this coming from the Haile Gold Mine near Kershaw, a mine which was operated during the World War for the production of pyrite to use in making sulphuric acid.

The total value of mineral production in South Carolina in 1937 was \$4,022,325.

### Electric Power

**T**HE total generating capacity of power plants in South Carolina at the close of 1939 was 634,111 kilowatts. Twenty-five of the 42 plants were hydro-electric capable of producing 500,528 kilowatts; 10 steam power plants had a capacity of 130,330 kilowatts; 7 internal combustion engine plants were capable of 3,253 kilowatts.

Production of electric power by public and private plants in 1939 totaled 1,568,009,000 kilowatt hours. Of this amount, 1,230,875,000 kilowatt hours were produced by water power plants and 337,134,000 kilowatt hours originated from fuel operated plants.

Primary power used in manufacturing at the time of the last census was 527,326 horsepower and consisted of 134,969 horsepower from steam engines, 61,888 horsepower from steam turbines, 293,308 horsepower from motors driven by purchased energy, 2,065 horsepower from internal combustion engines, and 35,096 horsepower from water wheels and water turbines.

### Taxation

**D**OMESTIC corporations doing business in South Carolina are subject to corporation income tax at the uniform rate of 4½ per cent on the entire net income. Foreign corporations pay the same percentage on such of their income as is attributable to business done within the state. In addition, domestic corporations pay an annual tax of two mills on each dollar paid to the capital stock with a minimum of five dollars. Foreign corporations also pay two mills on each dollar of the value of property used in the state. Transportation and utility companies are subject to an annual tax of three mills on the gross income earned within the state and four mills on each dollar of the true value of property owned and operated in South Carolina.

There is a license tax of 5/10 of one per cent per kilowatt hour of electricity manufactured, generated or sold.

The construction tax is graduated according to the size of contract. The school tax is three mills on all taxable property and all real and personal property is taxable.

The assessed value of all taxable property in 1939 was \$363,802,466.

### Labor and Wages

**T**HE population of South Carolina, which contains next to the smallest percentage of foreign born among all the states of the Union—0.6 per cent—has a density of 57 persons per square mile and only 21.3 per cent of the entire population are classified as urban. The colored race comprises 45.6 per cent.

The uniformity of a widely distributed population is gleaned from the fact that in 1930 there were only two cities in the state with a population exceeding 50,000, and the 20 townships in excess of 10,000 each are divided among 16 of the state's 46 counties. Similarly, 55 cities or towns with a population between five and ten thousand are distributed among 32 counties, and 231 towns with a population between one and five thousand are evenly distributed among all 46 counties.

Labor, of which there is an adequate supply, is loyal, willing and intelligent, while wage rates though differing considerably in various industries are comparable with those prevailing in the adjoining states.



# TENNESSEE



The metal producing works of the Aluminum Company of America at Alcoa is one of Tennessee's largest manufacturing establishments.

## INDUSTRIAL DEVELOPMENT OF TENNESSEE

BY

J. Charles Poe

Commissioner, Tennessee Department  
of Conservation,  
Nashville, Tenn.

THE ingredients for a successful industrial civilization lie at hand in Tennessee. The reasons that this State has not heretofore been one of the leading manufacturing states of the Union and only in the past score of years has come to be recognized as offering outstanding industrial opportunity, are inherent in the story of the development of the entire southeast.

It is the all too familiar story of a land of bountiful natural resources, fine climate, great agricultural yields, and adequate transportation. Yet, at the same time, it is the story of a colonial system under which the raw materials of Tennessee were shipped to the industrial centers of the North and East to be made into manufactured products, while Tennessee and the South contented themselves with the cash income from cotton and tobacco and a few other farm crops.

This constant drain forced Tennessee—and the entire South—to the realization a decade or more ago that its economy was all out of gear and that it was necessary to balance its

one-sided economy with more fabrication of its own raw materials.

Rather complete studies by the Tennessee Valley Authority and the Geology and Forestry Divisions of the State Department of Conservation give concrete evidence to support a claim that Tennessee ranks first in the South in the variety of its commercial minerals and about sixth in the nation. The State has eleven minerals which produce more than one million dollars a year each. They are in order of their importance:

Coal	Copper
Cement	Zinc
Phosphate rock	Marble
Sulphuric acid	Sand and gravel
Stone	Lime
Clay products	

Many of these materials have heretofore gone out of the State for use elsewhere. Many others have remained in the ground awaiting the capital and enterprise which would turn them into products for the service of society.

The most significant factor here lies in the rapid expansion of the chemical industries which will find just about all they need in Tennessee. This lusty young infant is expected to seek great expansion in the cheap power and non-metallic mineral region of Tennessee.

A brief review of Tennessee's industrial history shows rather clearly that the recognition for balance between agriculture and industry has finally arrived although somewhat belatedly.

The industries of Tennessee in the past have gone heavily on the side of raw-material production. Much of the development, until recent years, has been based on such things as lumber, agricultural products, coal, and iron.

For practical purposes, the dawn of industry in Tennessee came in the late 1800's and

early 1900's. Then began the period of industrial expansion and of capital investment. Despite a growing out of Reconstruction there was an increase of approximately 70 per cent in industrial production in 1870 in the State when compared with 1860. The increase was especially marked in grain milling, lumber products, textiles, and publishing.

Between 1870 and 1879 industry in Tennessee generally expanded with forest products and grain milling showing the greatest increase. By 1900 milling still ranked first with textiles making large gains. New industries including fertilizer production and processing of cottonseed oil and soybeans began with good promise for future development.

During the World War production of vegetable oils, lard compounds, and syrups (as a substitute for sugar) boomed. A powder plant was established near Nashville, but it was short lived being replaced by a large plant producing rayon and cellophane. About this time pig aluminum manufacture became important in Tennessee with production being centered in Alcoa.

The United States Census for 1921 shows that 75,446 persons were employed in 2,245 establishments and received wages to the amount of \$65,741,045. The amount paid for raw materials was \$225,951,368; finished goods were valued at \$374,038,316. The rank of industry in 1921, according to value of products, was: lumber and timber, grain milling, knit goods, cars and general shop work, food, publishing and printing, tobacco products, cottonseed products, foundries and machine shops, cotton goods, furniture, confectionery, patent medicines, cloth bags, coffee and spice processing, meat products, men's clothing, leather, chemicals, marble, ice, fertilizers, wagon construction and parts, and mineral and soda waters.

In 1935 the Census reports Tennessee having 1,911 establishments employing 112,434 employees. The payroll was \$81,245,588 and the value of products was \$520,969,985. In the order of value of products, the leading industries according to the Census classification were rayon and allied products, knit goods, shortenings, and chemicals. It is significant to note that, although textile production occupied a very prominent place in the manufacturing of the State, the production of textile machines and parts was comparatively insignificant.

On the basis of information given in the Census of Manufactures, 1937, manufacturing in Tennessee was diversified sufficiently to give the State the distinction of having more diversification of industry than any of the other Southeastern states.<sup>1</sup> In the group of sixteen states<sup>2</sup> that is sometimes called the Southern states only Missouri and Texas surpassed Tennessee in the number of industries with value of products in excess of \$5,000,000.

The Census of Manufactures, 1937, shows

<sup>1</sup>Virginia, North Carolina, South Carolina, Kentucky, Tennessee, Georgia, Alabama, Mississippi, Florida, and Louisiana.

<sup>2</sup>Above ten states plus Maryland, Missouri, Oklahoma, Texas, West Virginia, Arkansas, and District of Columbia.

that Tennessee contained 2,082 establishments with 135,073 wage earners that earned \$109,247,514 in wages. The value of products was \$707,986,784, which ranked Tennessee number 20 among the 48 states. Of the kinds of industries listed separately in the Census, the fifteen largest, shown (Table A) in the order of value of products, accounted for about 51 per cent of the total value of products in 1937. Among the leading industries are rayon and allied products, chemicals, shortening, meat packing, hosiery, grain mill products, boots and shoes, oil cakes and meal, cottonseed, and lumber and timber products. Lumber and timber products have fallen off in value; more careful use of the forests in the future may restore this industry to a prominent place once more.

Comparison of the figures of the Census for 1933 and 1937 disclose a net increase of 543 new establishments for the State of Tennessee (Table B) from which it may be seen that 70 per cent of the 543 establishments gained in Tennessee during this period were classified under food and kindred products and forest products.

This indicates a trend toward those industries which consume the agricultural and forest products of the rural areas. This means a market for dairy products and timber. The local processing of those materials aids in giving greater economic security to the farmer and the industrial worker in Tennessee through the creation of a new market, increased income in the local area, and a more nearly equal balance between industry and agriculture.

While it is true that there are five centers of industrial activity: Memphis, Nashville, Chattanooga, Knoxville, and the Bristol-Johnson City-Kingsport area, with the exception of the Memphis area, the industrialization has spread to the surrounding counties.

## DESIRABLE INDUSTRIAL DEVELOPMENTS

### General Factors

Opportunities for industrial development in the state exist along a wide variety of lines. While the opportunities are numerous, Tennessee looks toward stable, permanent establishments for its industrial prosperity. Within its borders, the industrialist seeking locations for his business will find a large number of communities varying in size and offering intelligent labor, oftentimes skilled, for employment.

Future industrial development in Tennessee should tend to conserve natural resources, should afford a decent income to a large number of people, and should add greater value to raw materials, on the whole, than industry in Tennessee has done in the past.

There are several types of industry that fit into a program having these general requisites. Any program for the better use of the resources of Tennessee should give consideration to the land of the state. Arresting erosion and restoring soil fertility is a job of primary importance in any industrial program because

perhaps two-thirds of the raw materials used in southern manufacturing are now produced by agriculture. Rural areas constitute about forty-three per cent of the potential markets for the goods made and sold by the cities. A sound agricultural and industrial development would be advanced by the development of local processing industries.

### Energy Sources

Hydroelectric power from TVA generators is available through affiliated distributing systems in practically every community in the state. Natural gas is already in parts of West Tennessee. There is every prospect that soon it will be available in all the principal cities and at intermediate points.

### Transportation

The year-round navigability of the Tennessee, Cumberland and Mississippi Rivers is an item favorable to industries in which bulk transportation is a principal factor.

The state has superior highway and airport systems. Railways connect all the large communities and are readily accessible from practically all communities regardless of size.

### Ceramics

An abundance of nonferrous clays, particularly in West Tennessee, warrants the suggestion that the manufacture of sanitary ware, pottery and enameling would be entirely possible. In fact, Tennessee is reputed to offer unusual opportunities in the entire field of ceramics. The availability of natural gas, from Louisiana fields, in West Tennessee adjacent to the clay beds is support for this claim.

### Enameling and Associated Manufactures

The possibility of enameling in Tennessee deserves special emphasis. Feldspar, and silica or flint are available in Northeast Tennessee. Ball clays and moulding sands are abundant in West Tennessee. Abundant electric power, at low industrial rates, is available at nearly any point in the state. Cheap transportation for raw materials on the Tennessee River might well combine favorably with the other factors mentioned for the establishment of enameling works.

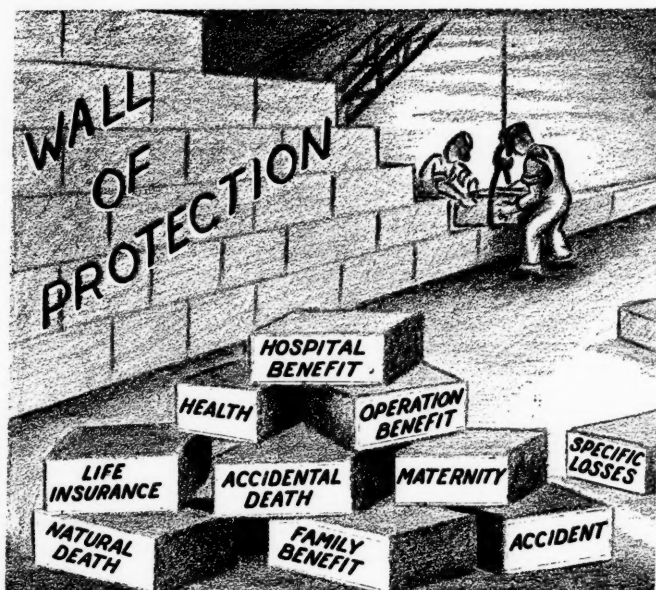
In connection with this industry would be the manufacturing of items requiring enameling. Some of these are sanitary ware, stoves, refrigerators, other kitchen equipment, and air conditioning apparatus. As it appears inevitable that air conditioning will find an increasingly wider market in the South, the opportunity for this association of industries in Tennessee is a prime one.

### Manganese

The occurrence of manganese in 13 counties of Northeast Tennessee and in five counties elsewhere in the state warrants further investigation of possibilities of its utilization. At present there is no extensive mining of this material.

(Continued on page 198)

## YOUR EMPLOYEES TOO WILL APPRECIATE



### having such a "Wall of Protection"

The Provident has been building them for over a half-century, to meet the needs of more than 1,000 U. S. industrial plants.

Built to your specifications, a Welfare Protection Plan—without cost to Employers—can assist Employees meet extra expenses caused by

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250 Industrial Plants  
14,000 Workers  
\$13,500,000.00 In Payrolls  
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testify to Nashville's standing as a manufacturing center.

If you seek a Southern location or contemplate a Southern connection, Nashville's fastest growing bank, with resources in excess of \$33,500,000.00, is prepared to assist you.

## THIRD NATIONAL BANK IN NASHVILLE

Nashville, Tennessee

Member Federal Reserve System and  
Federal Deposit Insurance Corporation

**PREFERENCE by Bankers of 68%**

**Bank in the Central South**

**BANKERS KNOW BANKS . .**

That 208 of the 306 national and state banks in Tennessee, or 68% bank with the American National Bank indicates the preference for this bank by its fellow bankers.

★ Each pin on the map indicates a bank which banks with the American National.

**THE AMERICAN NATIONAL BANK**  
NASHVILLE  
Member Federal Deposit Insurance Corporation  
CHARTER MEMBER FEDERAL RESERVE SYSTEM



## Industrial Development of Tennessee

(Continued from page 196)

### Cellulose Base

Wood and cotton are available in almost unlimited quantity for conversion into cellulose for plastics, fabrics and other chemical products. Chemical industries will find Tennessee favorable also because of the availability of electric power, abundant ground water, and its inland position.

### Air Craft and Equipment

Manufacturers of air craft and equipment will find to their advantage the state's inland position, its unusually high calibre airports, and the availability of light metals, plastics and fabrics.

### Complementary Industries

In some instances, established industries are dependent for raw materials on the products of out-of-state concerns. The provision of

these commodities within the State offers a wide and varied field.

Another group of industries which should increase in number are those which carry further the steps now taken in partly finishing the raw materials found in the State. Among these are the manufacture of aluminum alloy, brass, air craft, boats, insecticides, tools, and production of sanitary whiteware, lithopone, and zinc white.

Still another industrial group in which there may be expansion is that in which the State has a large market but has a deficiency of industries producing goods. Examples of these are manufacture of electrical appliances, glass, insecticides, and soap. In the case of electrical appliances, statistics show that sales in Tennessee rank high in the United States, either on a per capita or a total sales basis, but the State has little or no electrical appliance production.

### Distilleries

At present there is only one distillery op-

erating in Tennessee. State law now permits the manufacture and the disposition of alcoholic beverages in counties and municipalities on a local option basis. The production of grains in Tennessee, the availability of grains from neighboring states and the lack of local competition are factors favorable to the establishment of distilleries in the State. The quantity and quality of water supply for this particular industry would bear investigation in individual localities where other factors are favorable.

### Utilization of Agricultural and Forestry Crops

In line with the growing realization among Tennessee agriculturists that the productivity of the soil can and must be maintained, there is taking place a shift from soil-depleting to soil-building uses of land. Notable among these is the increased amount of hay and pasture. The utilization of these by livestock will result in increased production of raw materials for the tanning and packing industries. Dairy products, already well established, will also be on the ascendency. The development of industries utilizing these products will encourage the agriculturalist to stabilize their production. The benefits of stabilized agricultural production and of income are beneficial to the farmer as well as to the industrialist.

Lands are also being returned to forest production because they are unsuited to crops and pasture. In time the production of timber could be adequate to support some industries. At the same time, the establishment of such industries would encourage the farmer to convert more and more acres to timber production in order to enjoy a stabilized income.

### Local Aid to Industrialists

While a great deal of information may be obtained from Federal agencies, or local agencies and individuals in specific communities, the State government also attempts to cooperate with industrialists by supplying information on specific inquiries. While not equipped to handle all requests with equal degrees of adequacy, the Tennessee State Planning Commission, and the State Department of Conservation, both in Nashville, and the University of Tennessee, Knoxville, serve as clearing houses. Information requested usually can be supplied directly by one or another of these agencies; otherwise the individual requests are forwarded to specific localities or to other better qualified agencies or persons in the State for attention.

TABLE A  
Leading Tennessee Industries  
Arranged in the Order of Their Value of Products

Industries	Value of Products	Percent of Total of Leading Industries
Rayon and Allied Products .....	\$59,132,660	12.6
Chemicals not Elsewhere Classified .....	38,048,636	8.1
Shortenings (other than lard), Vegetable Cooking Oils and Salad Oils .....	36,457,022	7.8
Meat Packing, Wholesale .....	29,491,149	6.3
Hosiery .....	29,219,241	6.2
Flour and Other Grain Mill Products .....	22,673,578	4.2
Boots and Shoes, Other Than Rubber .....	20,897,976	4.4
Oil, Cake, and Meal, Cottonseed .....	20,150,709	4.3
Lumber and Timber Products not Elsewhere Classified .....	16,102,513	3.4
Bread and Other Bakery Products .....	15,866,429	3.4
Clothing, Work (Including Work Shirts), and Sport Garments, Except Leather .....	15,470,973	3.3
Heating and Cooking Apparatus, Except Electric ..	15,265,402	3.2
Printing and Publishing, Newspaper and Periodical ..	14,500,673	3.1
Tobacco (Chewing and Smoking) and Snuff .....	14,492,782	3.1
Knitted Underwear .....	14,358,311	3.1
Other Industries* .....	107,390,455	22.9
State Total .....	\$707,986,784	100

Source: Census of Manufactures 1937, Summary by Industries.

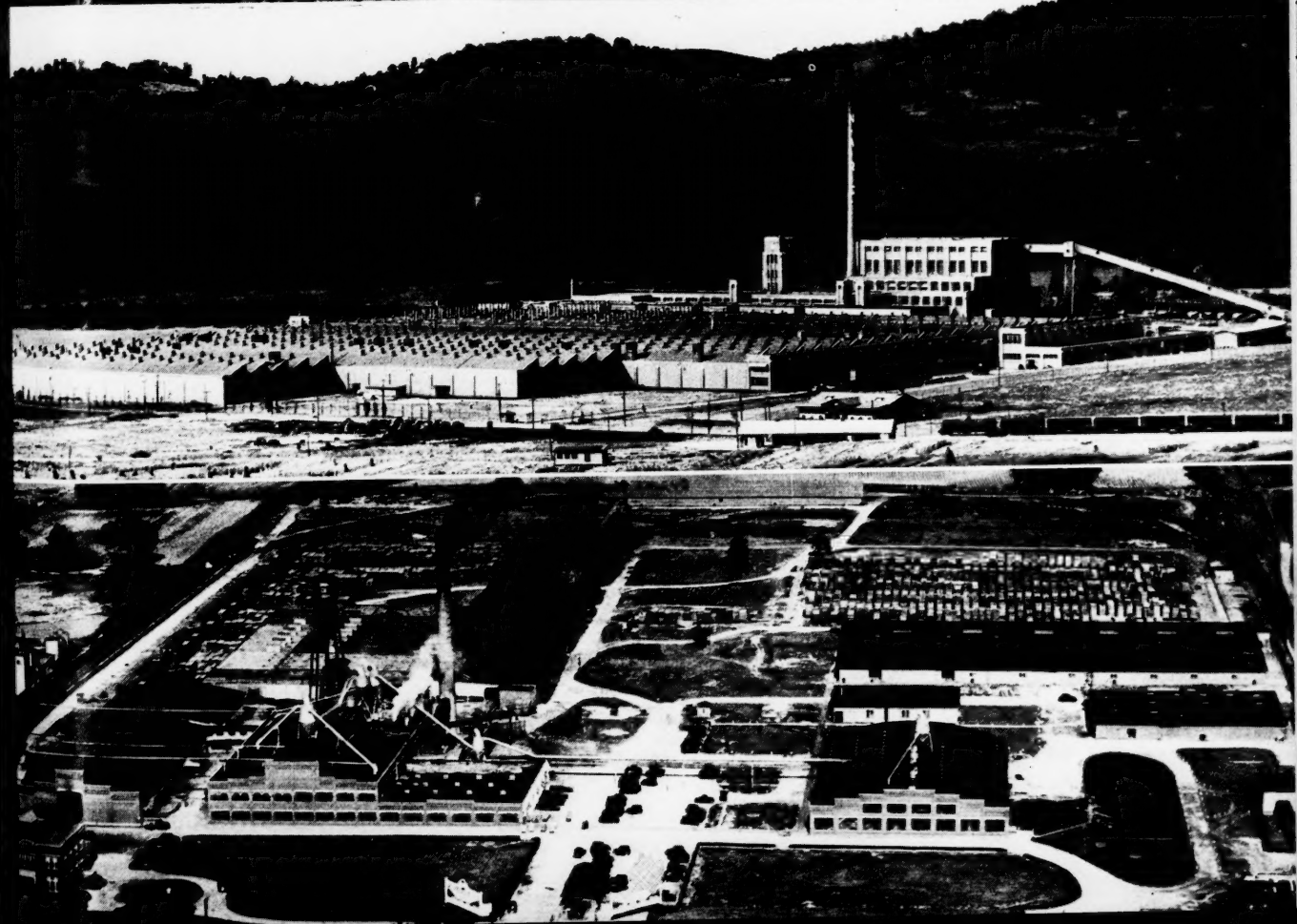
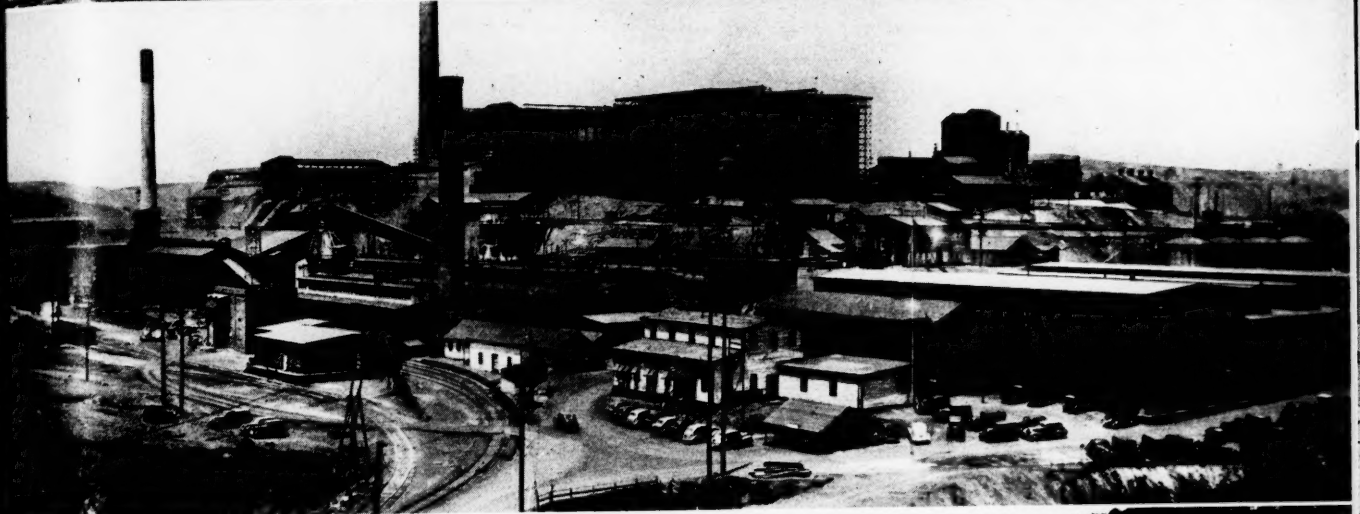
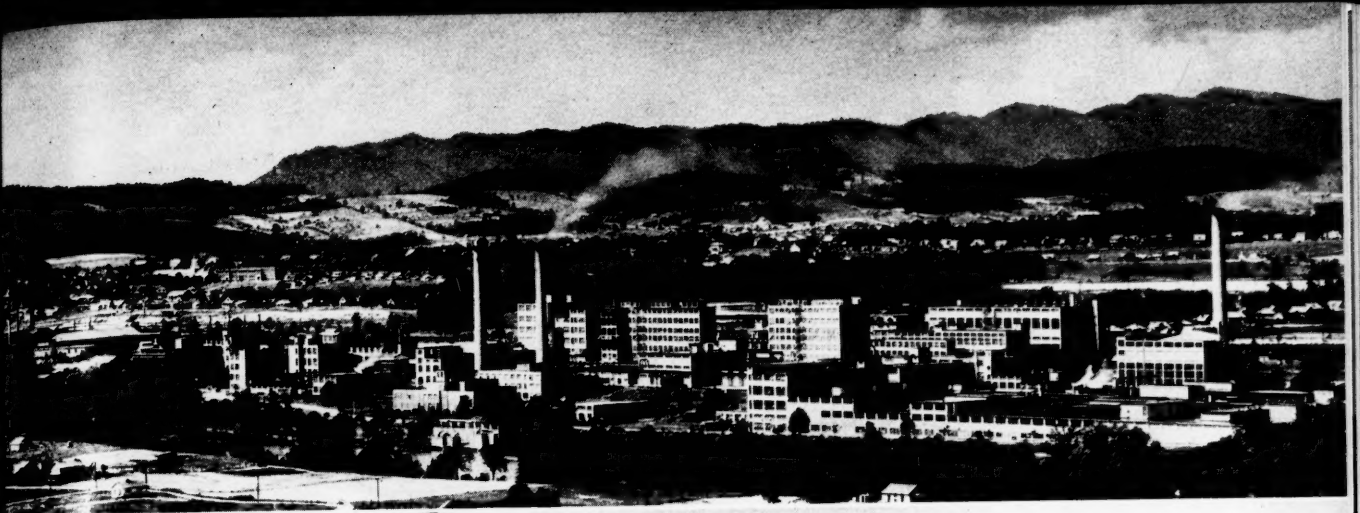
\* This item, "Other Industries," was the largest single listing under Tennessee value of products, 1937, and included many large industries, such as aluminum products and rubber tires and inner tubes.

TABLE B  
Types of New Establishments in Tennessee—1933-1937

Type of Industry	1933	1937	Difference	Percent of New Industries
Food and Kindred Products .....	464	655	191	35
Forest Products .....	235	422	187	35
Printing, Publishing, and Allied Industries .....	190	230	40	7
Stone, Clay and Glass Products .....	61	88	27	5
Chemicals and Allied Products .....	88	108	20	4
Iron and Steel and Their Products .....	34	55	21	4
Leather and Its Manufactures .....	14	26	12	2
Machinery .....	59	69	10	2
Rubber Products .....	0	3	3	1
Paper and Allied Products .....	18	19	1	1
Products of Petroleum and Coke .....	0	0	0	0
Textiles and Their Products .....	175	173	-2	-1
Non-ferrous Metals and Their Products .....	14	12	-2	-1
Transportation Equipment .....	3	0	-3	-1
Railroad Repair Shops .....	21	0	-21	-
Miscellaneous Industries .....	26	55	29	5
Industries not Classified .....	159	168	9	2
	1,561	2,083	522	100
Railroad Repair Shops* .....	21	—	21	—
	1,540	2,083	543	—

\* Railroad Repair Shops were not included in 1937 Census.  
Source: Census of Manufactures 1933 and 1937.

Tennessee's strategic location and wealth of natural resources is attested by the presence of these large plants: (from top to bottom) Tennessee Eastman Corporation at Kingsport making rayon, plastics and cellulose base products; Tennessee Copper Company, refiners and manufacturers of copper goods; North American Rayon Corporation of Elizabethton, makers of rayon; and the E. L. Bruce Company of Memphis, manufacturers of hard wood flooring.



# The Richest Opportunity in AMERICA



**S**ITUATED in the center of a 500-mile radius containing more than 51% of the entire population of the United States, equidistant between the Great Lakes and the Gulf and sheltered by the Appalachian Mountains, Tennessee has what is needed for industrial mobilization.

## *In Tennessee is found:*

● ● ● Vast stores of iron, coal, manganese, limestone, phosphate, zinc, copper, lumber, clays, marble, foundry and glass sands, and other minerals and raw materials for the immediate need.

● ● ● Abundant low-cost hydro-electric power generated by a system of TVA dams on the Tennessee River.

● ● ● A transportation system of 3,917 miles of railroad; 7,260 miles of State and Federal highways and 902 miles of nine-foot-channel rivers connecting river terminals of the Middle West and the ocean ports of the Gulf.

● ● ● Adequate supply of native labor that has demonstrated its aptitude and skill in almost

every form of industry. 99% native born population with a similarity of cultural background.

● ● ● A mild, pleasant climate permitting a greater farm yield and a variety of soils that produce every crop known to the temperate zone (except rice, sugar cane and citrus fruits) providing better living conditions at a lower cost. Fastest growing dairy state in the nation.

● ● ● Tennessee contains the materials and resources for a completely balanced agricultural, commercial and industrial empire.

● ● ● Tennessee is the "All American State" created by an infusion of North and South, East and West and possessing Nature-given resources for the defense and building of a Greater America.

## The State of

MANUFACTURERS RECORD



# TENNESSEE offers *exceptional Opportunities for:*

## AIRPLANES

This is due to the State's sheltered and central location, dependable labor and the world's largest aluminum plant.

## ALUMINUM CASTINGS

The local supplies of pig aluminum and foundry sand offer a tremendous advantage for the manufacture of aluminum castings, particularly airplane pistons and parts, engine blocks, and other products.

## PLASTICS

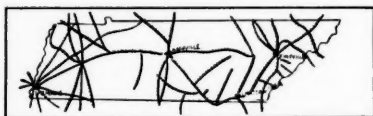
Both wood and cotton are available as basic raw materials to meet demand for fabricated products for airplane industry and continually growing list of new uses.

## COPPER PRODUCTS

Local copper supply is adequate for the manufacture of copper products, especially airplane parts and other urgent needs.

## RAILROADS

Eight major railway systems operate 3,917 miles of track in Tennessee.

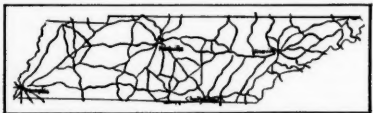


## RIVERS

Three principle rivers connect all sections of Tennessee with Gulf ports.

## HIGHWAYS

Seven thousand miles of State and Federal highways insure economical truck transportation.



## CLAY PRODUCTS

Tennessee has an abundance of ball clay, feldspar, and flint available for the manufacture of porcelain insulators, sanitary ware and other high-grade ceramic products.

## IRON CASTINGS

In addition to an abundance of iron and coal, Tennessee has an almost unlimited supply of foundry sand, making possible the economical manufacture of castings of every size and kind.

## STEEL

An abundance of iron ore, coal and limestone in the same immediate area makes Tennessee ideal for the manufacture of Steel.

## MANGANESE

Adequate manganese ore deposits offer a real opportunity for concentrating mills to meet the Nation's need created by diminishing imports.

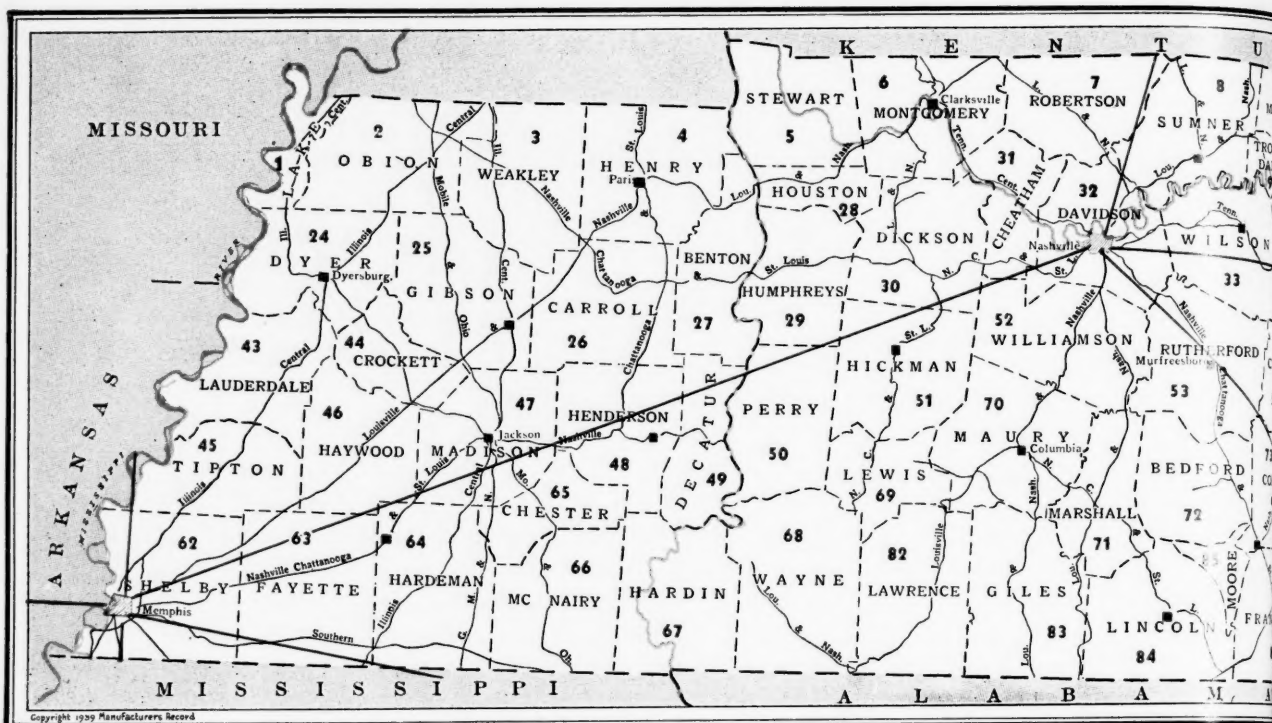
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The Department of Conservation will supply such surveys as relate to the more satisfactory and economical operation of your business, based on actual conditions and gathered at first hand. Inquiries treated in strict confidence.

# TENNESSEE

SOUTH'S RESOURCES ISSUE

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# TENNESSEE

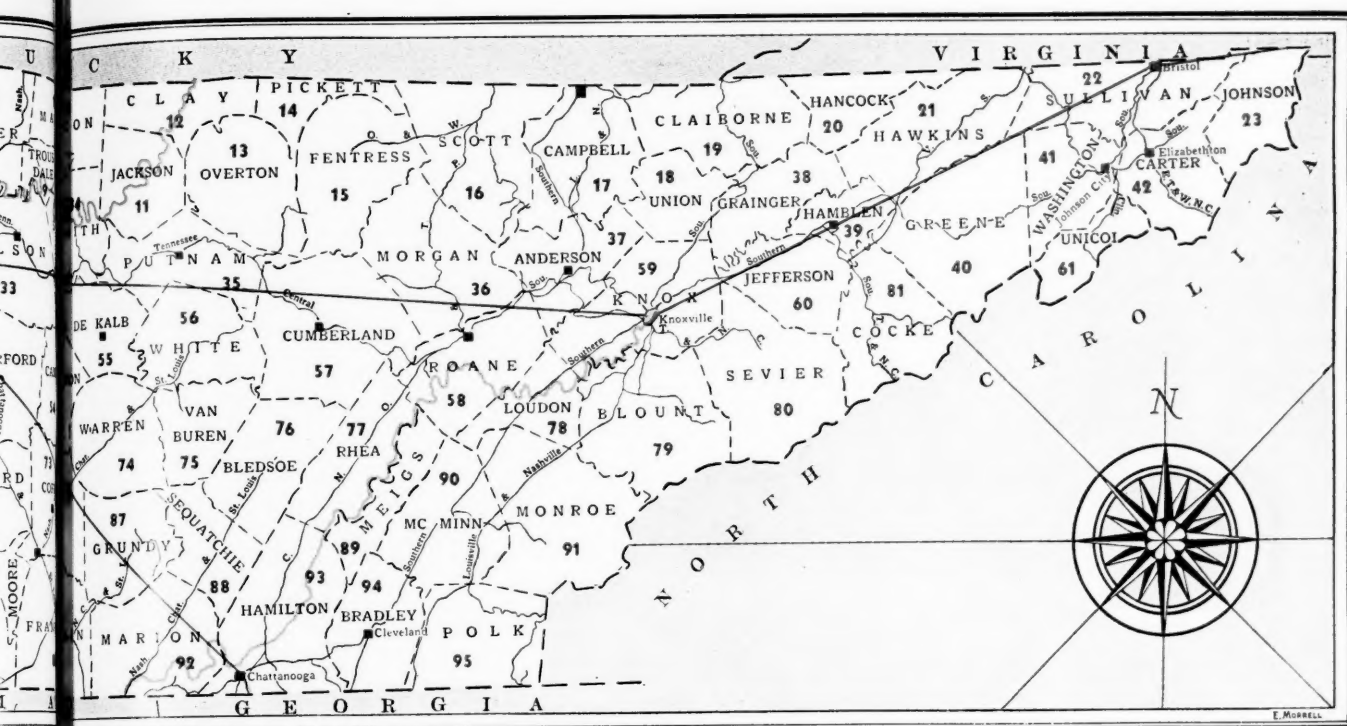
Its principal raw materials and transportation facilities, with facts on the reverse side pertaining to its industrial growth and opportunities for industry.

## COUNTIES IN WHICH MINERAL IS MINERALLY COMMERCIALY PRODUCED

Barite—15, 21, 78, 90, 91  
 Cement—22, 32, 59, 86, 92, 93  
 Chemicals—32, 70, 95  
 Clay—3, 4, 26, 27, 35, 47, 77  
 Coal—13, 15, 16, 17, 19, 35, 36, 37, 56, 57, 58, 75, 76, 77, 87, 88, 92, 93  
 Copper—95  
 Feldspar grinding—61  
 Fuller's Earth—4  
 Glass sand—22, 86  
 \*Gold—95  
 Iron ore, brown (limonite)—30, 51, 95†  
 Kaolin (sedimentary)—26

Lead—61, 95  
 Lime—28, 30, 50, 57, 59, 73, 86  
 Limestone & dolomite—22, 28, 30, 32, 51, 52, 53, 56, 57, 58, 59, 60, 71, 72, 73, 86, 92  
 Manganese—23, 42, 59, 61, 91  
 Marble—18, 59, 79  
 Molding sand—26, 27, 48, 64  
 Natural gas—10, 12, 15, 16, 30, 35, 36, 56, 74, 84  
 Paint pigment—52, 93  
 Petroleum—11, 12, 13, 14, 15, 16, 36  
 Phosphate rock—8, 23, 32, 49, 50, 51, 52, 69, 70, 83  
 Sand and gravel—2, 4, 6, 17, 22, 24, 27, 29, 32, 33, 35, 42, 58, 59, 62, 63, 64, 86, 88, 93  
 Sandstone & silica—35, 57, 77, 86  
 Shales and other miscellaneous clays—2, 4, 16, 21, 22, 26, 32, 35, 36, 41, 42, 47, 59, 62, 79, 80, 82, 93  
 \*Silver—95  
 Slate—79  
 Tripoli—49, 68  
 Zinc—59, 60, 61, 95

\*By-product of copper smelting.  
 †By-product of smelting pyrites.



#### TIMBER

**Oak**—2 to 8, 10 to 23, 25 to 32, 35 to 70, 72 to 95  
**Beech and maple**—12, 15, 43, 45, 48, 53, 62, 66, 67, 83, 84  
**Red gum**—2, 24, 27, 43, 45, 46, 62, 63, 66  
**Chestnut**—11, 20 to 23, 27, 38, 40, 42, 59, 61, 79, 80, 81, 90, 91, 93  
**Hickory**—5, 8, 13, 15, 17, 27, 32, 33, 34, 36, 45, 52, 53, 54, 56, 57, 62, 70, 71, 72, 74, 75, 87  
**Yellow poplar**—13, 15, 16, 35, 36, 37, 53, 71, 75, 95  
**Hemlock**—40, 90, 91, 95  
**Cypress**—1, 43, 45, 62, 66

There is also a small quantity of tupelo gum, cottonwood and aspen, ash, cedar, and red and white pine.

#### AGRICULTURAL PRODUCTS

**Corn**—All counties

**Cotton**—1 to 4, 24 to 27, 33, 43 to 50, 53, 62 to 74, 82 to 84, 86, 89 to 95

**Peanuts**—2 to 5, 24 to 30, 32, 43 to 53, 56, 59, 62 to 74, 77, 79, 82 to 84, 86, 88 to 94

**Soybeans**—1 to 6, 8, 10 to 13, 16 to 18, 20 to 22, 24 to 35, 37, 38, 40 to 63, 65 to 68, 70 to 74, 77 to 80, 82 to 86, 88 to 95

**Sweetpotatoes**—All counties

**Tobacco**—2 to 24, 26 to 43, 46 to 48, 50 to 62, 65 to 86, 88 to 94

Natural gas is available for consumption in the following counties: 24, 47, 62, 74, 84, 93

— Railroads

— Navigable rivers

— Airlines

■ Airports—also at principal cities printed in red



# Tennessee—

## Its Resources for Industrial Development

**T**ENNESSEE, admitted to the Union in 1796 as the 16th state, was first permanently settled in 1768 at Watauga in East Tennessee. In May 1772, these settlers organized the Watauga Association which had the distinction of being the first free and independent government established by men of American birth in America. In 1776, when the settlers placed themselves under the protection of North Carolina, their territory became known as Washington county but though this arrangement was temporarily satisfactory, dissension ripened when North Carolina ceded to the United States in 1786 all the territory which now comprises Tennessee. Everything might have gone well were it not for the fact that cession was not accepted by Congress within the two year period allowed. This left the territory virtually without government and consequently the people met in convention and elected a president, the outgrowth of which was the State of Franklin with John Sevier as Governor. Finally, in 1789 the territory was officially ceded to the United States continuing under territorial government till its entry into the Union in 1796.

With an area of 42,022 square miles, of which only 335 square miles are water, Tennessee ranks 34th in size while the estimated population of 2,880,000 places the state as 16th. The negro population consists of approximately 18.3 percent of the total.

### Climate

**T**HE climate of Tennessee combines to a limited extent the rigors of the North with the tranquility of the South so that, while not equable it is nevertheless pleasing. Changes are frequent, but except in the mountainous east, extreme variations are not prevalent. The average annual temperature for the state is 58° F. and the average annual precipitation is 50 inches with the heaviest rainfall in winter and spring and the driest period in the fall. Snowfall in the western half of the state averages 9 inches, and 12 inches in the east. The first killing frost usually occurs about October 22 and the last is seldom later than April 15.

### Transportation

**T**HE total road and highway mileage within the state is approximately 63,000 miles exclusive of city streets. Of this, the state highway system was responsible for some 7,528 miles including over 2,230 miles of gravel, chert or macadam, 1,865 miles of cement concrete, and 1,334 miles of variously treated hard surface roads; 2,076 miles have been surface treated and less than 50 miles have only been graded and drained. The remaining mileage of almost 55,500 miles comprise county roads and nearly 33 percent of these are provided with an all-weather surface.

Bus and motor freight routes serve all the principal communities within the state and connect them with points outside. During the fiscal year ending June 30, 1938, 57 passenger carriers operated 421 busses over 6,175 route miles in the state and carried 4,113,685 passenger. During the same period, 168 regular freight carriers operated 1,655 units over 21,365 route miles in Tennessee.

Railroad mileage in Tennessee aggregates almost 4,000 miles and 90 percent of it is operated by eight major companies through all but about eight of the state's 95 counties.

Tennessee's waterway transportation consists of portions of the Tennessee, Cumberland and Mississippi rivers. At present only certain sections of the Tennessee river, not continuous, aggregating some 335 miles have a nine-foot channel, but with completion of Gilbertsville and Chickamauga dams, together with some supplementary work, a total distance of 530 miles will thus provide a continuous nine-foot navigable channel. In the meantime, the importance of the Tennessee river as a medium of freight transportation may be gauged from the fact that in 1937 over 1,610,000 tons valued at more than \$12,755,000 were carried.

The Cumberland river is navigable at varying depths for certain sections of the 516 miles from the mouth to Burnside, Ky. Freight traffic over this river in 1937 totaled 468,881 tons, valued at \$6,883,494.

The Mississippi river is navigable throughout its length of Tennessee's western boundary with Memphis as the principal port. In 1937 freight traffic through this port aggregated 1,

875,177 tons valued at \$122,414,421. At Memphis and other towns and cities located throughout the length of these navigable waterways, warehouse and similar facilities are available.

Airlines operating five different routes over Tennessee provide a rapid means of passenger and express transportation from east to west as well as from north to south.

Within approximately 750 miles of the four corners of the state is more than 47 per cent of this country's total area, over 78 per cent of the total population, nearly 74 per cent of the wholesale and almost 73 per cent of the total retail trade.

### Manufactures and Finance

**T**HE total value of Tennessee's manufactured products in 1937 was \$707,986,784, an increase of \$187,017,799 or approximately 38 per cent over the 1935 figure of \$520,968,985. The 1937 census report lists 86 industries represented by three establishments or more and of these 70 have products annually valued in excess of one million dollars. Among the latter rayon and allied products far exceed all other industries with products valued at \$59,132,660. Other important manufactures with their respective values are: chemicals, \$38,048,636; shortenings (other than lard), vegetable, cooking and salad oils, \$36,457,022; meat packing, \$29,491,149; hosiery, \$29,219,241; clothing, \$24,014,045; flour and other grain mill products, \$22,673,578; printing and publishing, \$21,122,548; cotton yarn, thread and woven goods, \$21,016,738; boots and shoes, \$20,897,976; cottonseed oil, cake and meal, \$20,150,709; lumber and timber products, \$16,102,513; bread and bakery products, \$15,866,429; heating and cooking apparatus (except electric), \$15,265,402; tobacco, \$14,492,782; and knitted wear, \$14,358,311.

The payroll of the 135,073 employees in the state's 2,083 manufacturing establishments was \$109,247,514 while the cost of materials, fuel, electric energy and contract work amounted to \$412,360,076 and \$295,626,708 was the value added by manufacturing processes. Whereas in 1935 there were nine of the state's counties with no manufactures, this number was reduced to only four in 1937.

Individual deposits in the 299 Tennessee banks which reported to the Comptroller of the Currency, June 30, 1939, totaled \$520,288,000. Capital stock, including capital notes and debentures, amounted to \$36,790,000, and aggregate resources were \$589,420,000. Bank clearings of three exchanges reporting in 1939 were \$2,171,823,000. The internal revenue collections for the calendar year 1939 were \$32,912,422.

### Agriculture

**A**LTHOUGH the cash farm income of \$132,378,000 in 1939 was only about 20 per cent greater than the payroll of Tennessee's various industrial activities, nevertheless nearly 50 per cent of the entire population is dependent upon agriculture for its livelihood. Of the 1939 amount \$58,195,000 was derived from livestock and livestock products, and \$58,470,000 came from crops grown on the state's 5,902,900 farm crop acres. The principal crop was cotton and the 450,000 bales from 726,000 acres yielded a cash income of \$19,851,000 in addition to \$3,573,000 received from 200,000 tons of cottonseed. The production of 102,716,000 pounds of tobacco from 117,900 acres yielded \$13,077,000. Other important crops included 6,000,000 pounds of peanuts, 52,700,000 bushels of corn, 4,117,000 bushels of wheat, and 3,713,000 bushels of sweet potatoes.

The number of livestock in Tennessee in 1939 was 3,354,000 valued at \$99,988,000, with cattle forming the largest group of 1,228,000 valued at \$39,763,000. Cows and heifers kept for milk number 578,000 valued at \$24,276,000. Dairy produce yielded a cash farm income of \$26,638,000 with milk contributing \$15,825,000. Factory production of dairy products included 20,270,000 pounds of butter, 15,070,000 pounds of cheese, and 59,255,000 pounds of evaporated milk.

### Timber

**N**EARLY 50 per cent of Tennessee's total land area of 26,679,000 acres is classified as forest land. This area comprising 12,820,000 acres supports a commercial forest area of

(Continued on page 206)

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## Tennessee

(Continued from page 204)

12,555,000 acres including 470,000 acres old growth and 2,670,000 acres second growth saw timber, or a total of 3,140,000 acres, and 6,275,000 acres of cordwood.

The total saw timber stand of 16,950,000,000 board feet is made up of 3,400,000,000 board feet of softwoods (750,000,000 board feet old growth and 2,650,000,000 board feet second growth) and 13,550,000,000 board feet of hardwoods (4,030,000,000 board feet old growth and 9,520,000,000 board feet second growth). Southern yellow pine accounts for 1,980,000,000 board feet of softwoods while other important softwoods include cypress (330,000,000 board feet), hemlock (320,000,000 board feet), white pine (220,000,000 board feet), and miscellaneous softwoods (550,000,000 board feet). Most outstanding among the hardwoods are oaks with 7,900,000,000 board feet, followed by yellow poplar having 1,350,000,000 board feet. The remaining hardwoods are: tupelo and black gum, 740,000,000 board feet; red gum, 650,000,000 board feet; beech, birch and maple, 210,000,000 board feet; and miscellaneous, 2,700,000,000 board feet.

The cordwood area comprises 4,337,000 cords of softwood and 17,250,000 cords of hardwood or a total 21,587,000 cords. In addition, on the saw timber area there are 6,600,000 cords of softwood and 26,400,000 cords of hardwood or a total 33,000,000 cords making a grand total of 54,587,000 cords on all commercial forest land except a few thousand on restocking areas.

### Mining and Minerals

**B**ECAUSE of its extreme elongated east-west extension, Tennessee, crossing three major physiographic provinces, presents a variety of land forms probably unique among all the states and results in the existence of a large number of minerals. On the reverse side is indicated those counties in which present minerals are now produced. In addition, there are many deposits of these same minerals as well as of others which have been worked in the past and probably will be again, for in many instances the deposits contain extensive reserves. Too, there are many deposits of minerals known or believed to be of commercial value which have not hitherto been approached.

Barite is at present produced in several counties and is available in many other places. It is suitable for use as a paint pigment, in chemical compounds, etc.

Bauxite has been mined in the past, and known deposits of commercial value occur in places as thick as 100 feet.

Clay resources are many, varied and widely distributed throughout the state. In western Tennessee ball, wad, sagger, and other high grade clays are available while in the eastern part shales are the basis of heavy clay products. In middle Tennessee residual and alluvial clays are abundant.

The coal area of the state is largely confined to the east central counties of Cumberland Mountains, and comprises a series of bituminous and cannel coals with shales and underclays, as much as 4,000 feet thick.

Copper in commercial quantity is confined to Polk county which is the largest producer of copper and sulphuric acid east of the Mississippi. Both gold and silver are by-products of the smelting.

Dolomites and dolomitic limestones exist in unlimited quantities in eastern Tennessee, much of it being nearly pure and suitable for the chemical industry.

Fluorspar occurs in considerable quantity with barite in middle Tennessee and the flotation process of separation holds much encouragement.

Granite, which is one of the most important undeveloped resources of the eastern part of the state, is most attractive in appearance and exists in beds large enough to yield block building stone. From the magnetic iron ores of the same region are obtainable limonite and rutile containing as high as 20 percent titanium dioxide.

Hematite, limonite, and magnetite—the three principal iron ores, all occur in commercial quantities in four distinct belts between the state's eastern boundary and the west-middle part of the state. Sphatite ore also occurs locally.

Galena, widely distributed through the limestone of east and middle Tennessee, occurs in varied abundance and offers possibility of renewed lead production.

Limestone is the state's most extensively distributed rock and is widely used for a variety of purposes from lime for soil, building cement and chemicals to flux for blast furnaces. From the same source is derived a good supply of marl for liming the soil.

Manganese deposits are found in many counties but production has been retarded by the difficulty of treating ores. With the exception of a carbonate ore in Sevier county all Tennessee deposits are of the oxide variety.

Marbles of a variety of colors and shades occur extensively in the east and some have been found among the middle Tennessee

limestones. Knox county is the chief area of production and its marbles are well-known for their uniformity and resistance to weathering.

Oil and natural gas have been widely sought throughout the state and though some has been found in outlying sections the principal source to date is in the Mississippian limestones of north central Tennessee.

Tennessee phosphates of brown, blue or black, and white are among the state's most valuable minerals, having ranked second in production for the country over a period of years. Deposits are extensive and almost entirely confined to central Tennessee.

Among the remaining important minerals are molding and glass sand; resources of the latter it is believed are sufficient for a well founded industry. Many deposits of sandstone are known in addition to those now worked. Tennessee sandstones are of unique coloring and design and highly resistant to wear and weather.

Although slate has been developed to little or no extent, the known deposits are large and believed to constitute a large reserve of commercial character.

Zinc ores have been mined or prospected for many years in several eastern counties and though sphalerite is the chief ore produced in two districts to the northeast of Knoxville, oxidized ores also occur while some sphalerite ore occurs in middle Tennessee.

### Electric Power

**P**RODUCTION of electricity in Tennessee during 1939 totaled 2,044,177,000 kilowatt hours, an increase of 297,980,000 kilowatt hours over the 1938 figure. Of the 1939 amount 1,459,680,000 kilowatt hours were the product of hydroelectric plants and 584,497,000 kilowatt hours were produced by fuel operated plants.

The total generating capacity of power plants in Tennessee at the end of 1939 was 593,212 kilowatts. Of the 59 plants, 21 were hydroelectric with an installed capacity of 390,959 kilowatts and 25 were steam power capable of developing 199,090 kilowatts. The remaining 13 were internal combustion engine plants capable of 3,163 kilowatts.

### Taxation

**A**LL corporations doing business in Tennessee are required to pay a franchise tax at the rate of 15 cents on each \$100 of issued and outstanding capital stock, surplus, and undivided profits at the close of the corporation's calendar or fiscal year. The minimum tax is \$10. Another tax all corporations are obliged to pay is the excise tax of 3.75 percent of net earnings from business done within the state. Income tax, which is at the rate of six percent, is levied upon income derived from dividends on stocks and interest on bonds.

The principal county and municipal taxes are the general property tax and the privilege tax. The county property general tax rates in 1937 ranged from 88 cents to \$4.08 per \$100 of assessed valuation with an average for all counties of \$2.22. In the same year municipal general property tax rates varied from 50 cents to \$4.00 per \$100 of assessed value. The law provides that counties and incorporated cities may levy a privilege tax in the same manner as, and not in excess of the amount similarly levied by the state.

The assessed value of taxable property in Tennessee for 1939 was \$1,501,861,042.

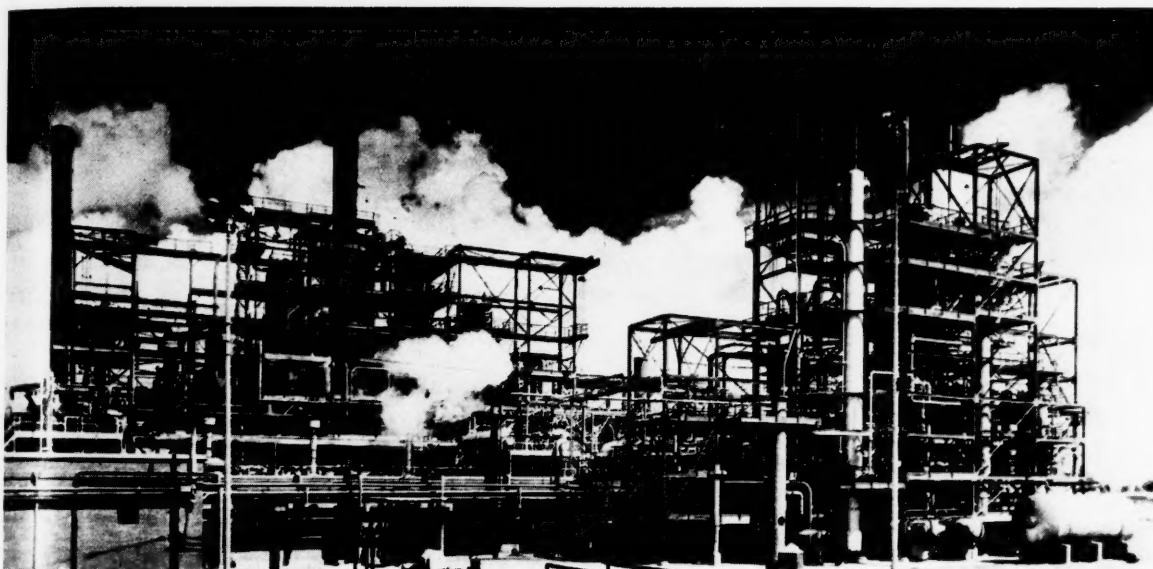
### Labor and Wages

**W**ITH a density of 62.8, nearly 66 percent of Tennessee's population is classed as rural and more than 60 percent reside outside incorporated cities or towns. Of the urban population over 71 percent are concentrated in the cities of Nashville, Memphis, Chattanooga and Knoxville. Native whites comprise 81.23 percent of the total population and foreign born whites only 0.50 percent.

Due to changing conditions and the variation of rates in different localities it is difficult to approximate wage rates. However, the range existing in the districts of Nashville, Memphis, Chattanooga, Knoxville, and Johnson City may possibly be accepted as above the state average and consequently a dependable guide. Agricultural workers from \$1 a day to \$50 per month. Building and construction workers from 30 cents per hour for unskilled help to \$1.62½ for the highest paid skilled labor. Clay products vary from 25 to 60 cents per hour. Dairy products range from \$2 per day to 60 cents per hour. Mining varies from 25 cents to \$1 per hour. Forestry averages 30 cents an hour. Foundries range from 27½ cents per hour to \$7.50 per day. Lumber products from 25 cents to \$1.25 per hour. Machine shops from 40 cents to \$1.10 per hour. Meat packing averages 45 cents per hour and textiles \$15 per week. And miscellaneous industries range from a minimum average of 30 cents per hour for unskilled labor to a high average of 90 cents for skilled help.



# TEXAS



*Texas is not only the largest producer of petroleum, but also the largest refining state with many great refineries such as this one of the Atlantic Refining Company at Atreco near Port Arthur.*

## TEXAS IN PERSPECTIVE

BY

**Elmer H. Johnson**  
*Bureau of Business Research,  
The University of Texas,  
Austin, Texas*

NO evaluation of Texas and its future can be considered complete even in outline which does not give adequate attention (1) to the geographic scope of the State as a whole and the characteristics of its several major divisions or regions; (2) to the historical perspective of the State's economic development with proper attention to the relationships between economic progress in Texas and conditions in the rest of the nation; and (3) to the economic perspective particularly with reference to the economic structure of the State at present and of some of the problems that no doubt will loom up as highly important as the course of events in the near future makes itself felt. Still another aspect of an evaluation of the State is concerned with the status of Texas in the integrated economy of the nation as a whole.<sup>1</sup>

Prior to 1900 Texas was primarily an agricultural and range country although a considerable development of lumbering had occurred in East Texas.

Between the 1820's and 1870's the Anglo-American occupation of Texas had been that

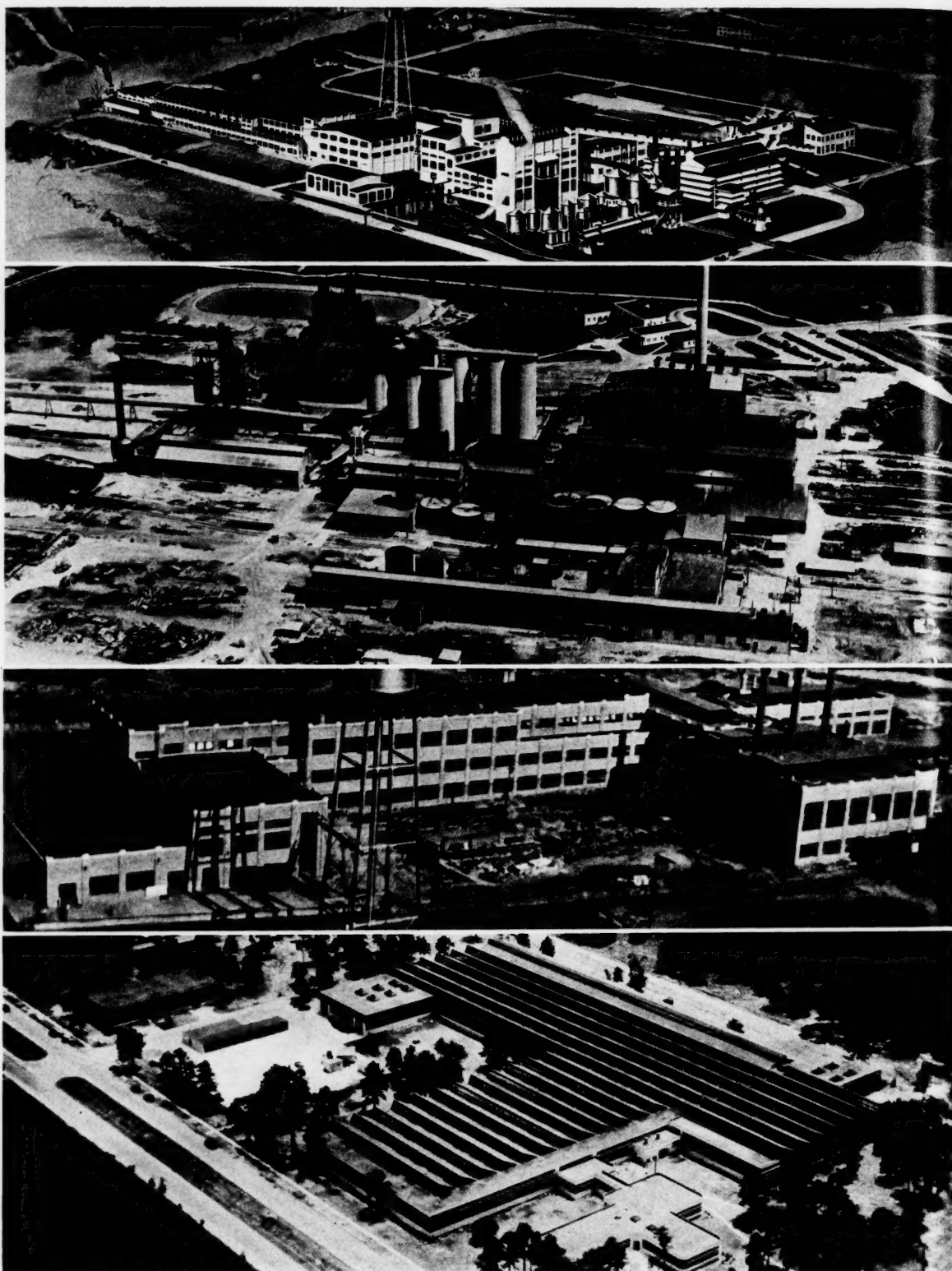
<sup>1</sup> Consideration of the rise of the Texas and Southwestern market, the potentialities of market-following industries, and the trade relations of Texas with Latin America, particularly Mexico, are all deliberately omitted from this brief article.

of isolated, self-sufficing communities advancing upon the steadily westward migration of the Indian frontier. Exports during this period were few in number and small in volume owing to the lack of adequate transportation. The first marketing in large amounts of Texas products occurred in the trail-driving era which had begun prior to 1870 but which reached its large proportions in the decades of the '70's and '80's. The latter quarter of the nineteenth century as a matter of fact, witnessed a veritable economic revolution in Texas. The Indian menace was laid for all time. The cattleman's frontier pushed westward in a period of unexampled expansion of the range industry. Railroads pushed into the Black Lands, opening them to cotton growing with the result that Texas almost overnight became the premier cotton producing State in the nation; pushing westward, the railroads wrought a complete trans-

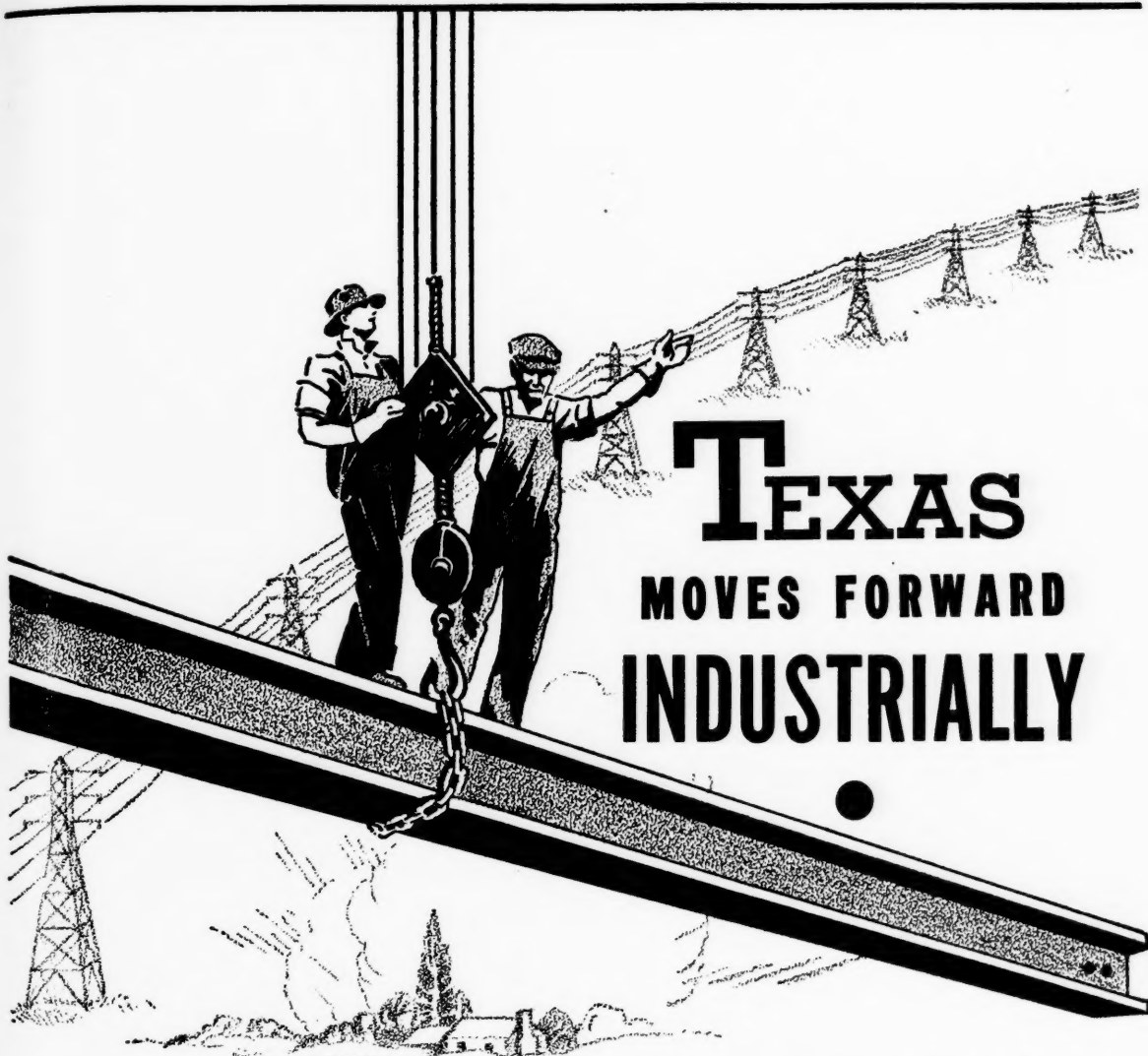
formation of the ranch country. As concomitants of the railway extension into the Western Plains went deep well-drilling, the wind-mill, and barbed-wire fencing, to be followed some distance eastward by the farmer. The period of growth of the large ranches in Texas, in South Texas following the Mexican War and in West Texas after 1875, constitutes one of the most prominent episodes in the Anglo-American conquest of the West.

Since 1900 changes in Texas economic activities have come with an ever increasing tempo. Agriculturally, the cotton frontier has been pushed onto the climatic limits for the successful growth of the cotton plant. The adaptability of the cotton plant to the environment of the Southwest and the suitability of the rolling prairies and the Plains of Texas to the growing of cotton by use of mechanical equipment are factors that necessarily will continue to play a large part in the future of cotton growing in the United States. The hard winter-wheat producing region has extended itself from its center in Kansas well into the Texas Panhandle and other areas of northwest Texas. The western and southern portions of the State have become the dominant centers of the Grain Sorghums agricul-

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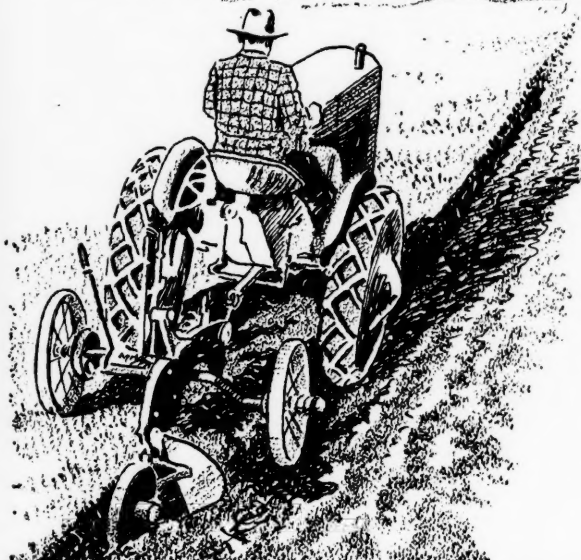


Top—The Champion Paper and Fibre Company's plant near Houston has recently almost doubled its capacity and is the largest plant of its kind in the state. Top center—The Southern Alkali Corporation plant at Corpus Christi is one of several plants in Texas using the vast mineral resources for the manufacture of various chemicals and chemical products. Lower center—The Southland Paper Mill at Lufkin, which went into production in January, 1940, is the first newsprint mill in the South using Southern pine for its raw material. Bottom—The American Can Company at Houston is another plant establishing a new industry in that part of the southwest.



# TEXAS

## MOVES FORWARD INDUSTRIALLY



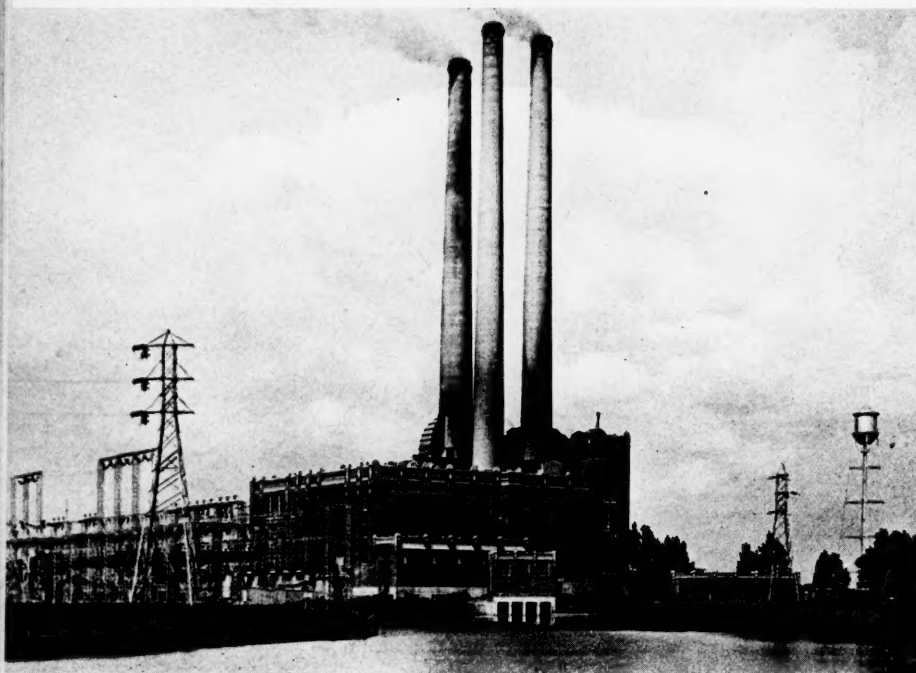
The Lone Star State is on the march... industrially. Guided by the magic of chemistry, Texans are teaming industry with agriculture, using farm products as raw materials for manufacturing processes.

The state's abundance of these agricultural and other raw materials; her variety of favorable locations for industrial plants, large and small; the sympathetic, enthusiastic attitude of Texans; the availability of low-cost, dependable electric power... are only a few of the factors which combine to give Texas the ideal requisites of a modern industrial area. The Texas Power & Light Company invites inquiry regarding industrial opportunities in the territory it serves.

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## Texas in Perspective

*(Continued from page 207)*

tural area of the United States. It has become a commonplace observation to assume that the entire Cotton Belt is a one-crop region. It is true that cotton long occupied a dominant position in the New Cotton Belt of the Southwest. It is to be remembered, however, that the range livestock industry has been an important undertaking in the Southwest since long before cotton became commercially important in that section of the country. A diversified livestock production, the importance of grain sorghums, cotton growing, the production of cottonseed cake and meal, and large-scale wheat production (over portions of northwest Texas) combine to give a diversity in agricultural enterprises that has not been developed on any such scale in the Old Cotton Belt of the Southeast. There has been in recent years a steady growth in Texas of the dairy industry and of milk products plants. Other aspects of the livestock industry have made striking readjustments and Texas remains the home of the great cattle ranches of the country.

Fruits and vegetables have become important enterprises on a specialized scale, one great impetus in this growth having come from the development of citrus production in the sub-tropical lands of the Lower Rio Grande Valley. It is important to note that the beginnings of a substantial commercial development of the Lower Rio Grande Valley followed on the heels of the building of railroads into that district.

The basic condition which sets the pattern of the agricultural and livestock enterprises of the Southwest, and particularly the Texas

portion of the Southwest, off from other regions of the country lies in the breadth and variety of the dominant natural conditions of the Southwest. And now we are witnessing a transformation of another sort that is just beginning to make itself felt in the forest lands of East Texas.

It has been, however, the oil industry and latterly natural gas which have provided the mainsprings in the transformation of Texas since the turn of the century. Although the existence of oil had long been known in Texas it was the Spindletop discovery well of 1901 that centered the limelight of the oil industry upon Texas. The spectacular features of the growth of the oil industry in Texas, its relations to the oil industry elsewhere, and particularly its position in American industry are subjects worthy of extended treatment.

The outstanding features, and they are outstanding, of the Texas oil industry are generally well known. A brief statistical summary of the Texas position in oil production may serve, however, to bring the place of Texas into a clearer perspective. Texas at the end of 1939 had produced a total of more than six billion barrels of crude oil—a little more than 27 per cent of the total production of oil in the United States from 1859 to date. To put it another way, Texas' total production to date has been more than 37 per cent of that of the rest of the United States exclusive of Texas. This predominant position is of special importance as Texas has only recently reached its outstanding position in oil production; it did not become the leading oil producing state until the late 1920's.

But in the past decade Texas' position has been dominant having furnished slightly more

than 40 per cent of the national output. During the period of the past ten years the output of Texas oil has almost reached the sum of Oklahoma's total output from its beginning to date and since 1930 Texas' production has amounted to 80 per cent of California's total output to date.

Texas during the past decade has produced 60 per cent as much oil as the entire United States produced prior to 1930.

As to reserves Texas also occupies an enviable position. A recent estimate of proven reserves of oil for the United States gives to Texas nearly 53 per cent of the total. Texas as of January 1, 1940 had produced more than 6,000,000,000 barrels of oil; its proven reserves at that time were estimated at 9,875,000,000 barrels. Texas leadership in oil reserves, in oil production and in oil refining are necessarily items of importance in arriving at a comparative picture of Texas and oil. The oil resources of Texas, a function of the geologic architecture and a real extent of the State continue to hold the spotlight in charting Texas progress.

Less spectacular perhaps but none the less significant in looking into the future are the natural gas reserves of Texas—reserves widely dispersed over the State, including vast fields with high pressures, the products of which are now rendered mobile by the technique of long-distance transfer.

The great growth of the oil industry in Texas has been paralleled by the growth of urban centers and metropolitan districts which in themselves are elements worthy of evaluation in considering the prospects of Texas development in the future.

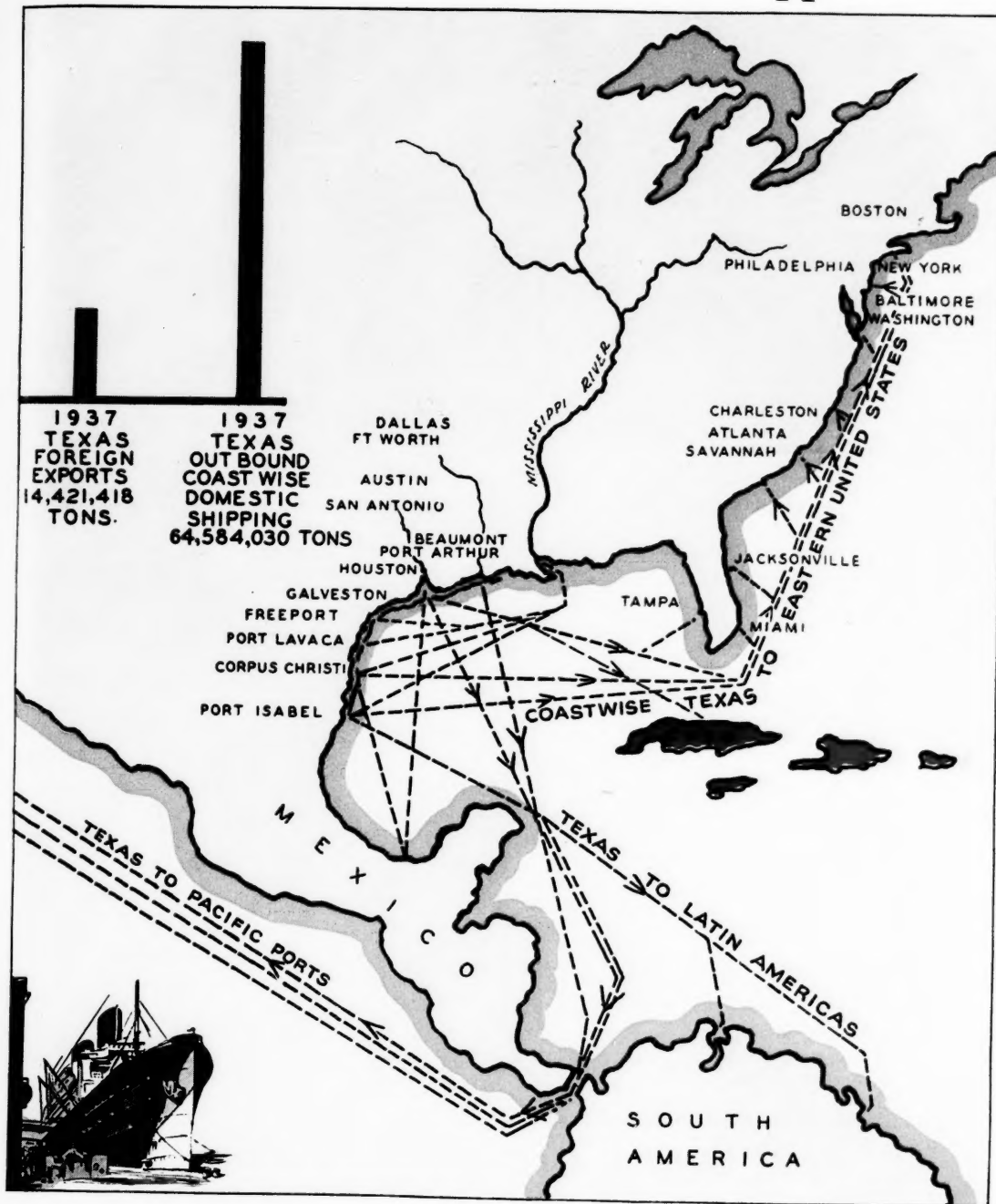
The large features of the agricultural empire in Texas were obvious by 1910; by 1930 the bigger features in the realm of oil were apparent in the State. And since 1930 the growth of the oil industry has been so steady and its effects so inclusive as to counteract in large measure the adverse conditions.

In the light of developments since 1930, of developments made in the greatest of our depressions, we are able to see two new aspects of the economic growth of Texas in broader perspective. One of these concerns the rising importance to significant levels of the State's wide and varied wealth in non-metallics; the other embraces the potentialities of the large replaceable resources of timber in East Texas.

Common salt has long been produced in Texas; earlier it was almost entirely produced for local consumption; later, it was organized for wider distribution. Likewise, non-metallics for structural uses—stone, cement, gypsum—

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# TEXAS — The Land of Industrial Opportunities

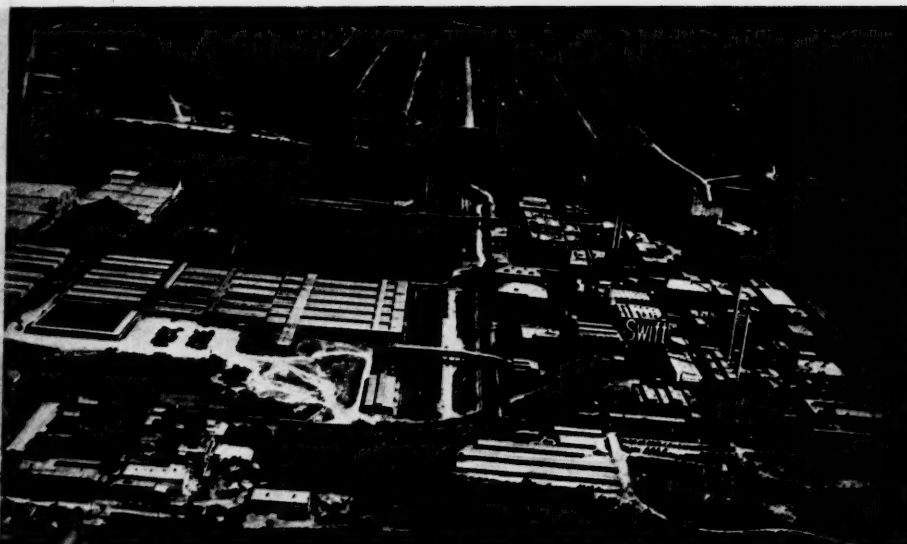


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AUGUST NINETEEN FORTY



*Important as other industries are, Texas always has been and still is a great cattle state providing the material for a large meat packing industry. This plant of the Swift Packing Company at Fort Worth with adjoining stock yards is one of the largest in the state.*

## Texas in Perspective

*(Continued from page 210)*

have long been important in the State. Also, sulphur has been a non-metallic product of Texas since before the Great War.

The great change in the picture of our non-metallics has come with the chemical exploitation of salt and brines in the establishment of large-scale new industries. The juxtaposition along the Gulf Coast of large salt deposits, of adequate supplies of natural gas, and of the availability of water transportation provides the setting for a tremendous growth of the heavy chemicals industry in Texas, a development of great significance for the future. The rise of the Kraft paper industry in the Coastal Plains sections of the South has provided a growing market for chemicals required in this industry. As a consequence of this and of other factors, brines from shallow deposits of the southern and central portions of the High Plains are in the course of being developed on a rather extensive scale.

Obviously, freight rates constitute a powerful factor in the growth of new industries anywhere in the interior of the Southwest

but the development in the vicinity of Carlsbad, New Mexico, of potash deposits and the program for further exploitation of non-metallic resources in the New Mexico portion of the great Permian Basin reflect the powerful pull of these mineral resources upon the map of industry.

The other item of development during the past decade is concerned with the utilization of the wood resources of East Texas. Historically, it is worthy of note that the first successful run of kraft pulp made from southern woods by the sulphate process was made in the little paper mill at Orange, Texas, in 1911. Upon this accomplishment has been largely modelled the entire growth of the kraft industry in the South during the past decades. And the first commercial production of newsprint from southern woods has but recently begun in the Southland Paper Mills plant near Lufkin, Texas. Another turning point in the development of Texas papermaking was the decision of the Champion Fiber and Paper Company to establish its southwestern plants on the ship channel at Pasadena, near Houston. Potentialities obviously exist for the production of wall-board, insulating board and

the like. And the field of plastics is an untouched potentiality in Texas.

Nor does this brief paper include all the high points of recent economic developments in Texas; canning of fruit products and vegetables has expanded into a substantial industry; there has been a steady growth in the manufacture of products from cotton seed oil, and this is a field of considerable future; and programs for the expansion of meat packing in the State are under way. Space permits but mention of the growth and importance of the electric power and lighting industry in the State. The utilization of lignite for the manufacture of "Darco," an activated carbon product, the production of fuller's earth, the making of certain cotton textiles, the scouring of wool, glass manufacturing, furniture making and the like serve to illustrate further the diversity of Texas industries.

The potentialities of the tourist business are not to be overlooked. Such things as climatic attractions in the winter season, fishing on the Gulf, and great natural scenic displays, such as those of the Big Bend Country in Trans-Pecos, Texas, are all to be considered as features highly important to Texas.

To sum up: The status of economic activities in Texas and their potentialities are a function of the vast and diversified natural endowment of the State in combination with its geographic location and orientation. The diversity of its rich agricultural resources, its rapidly growing forests and its extensive grasslands, the diversity and the large reserves of its mineral resources, the key position occupied by its oil and natural gas reserves, and its great wealth in non-metallics present in a substantial manner the necessary bases on which the pattern of an economic empire of no small dimensions is being built in Texas.



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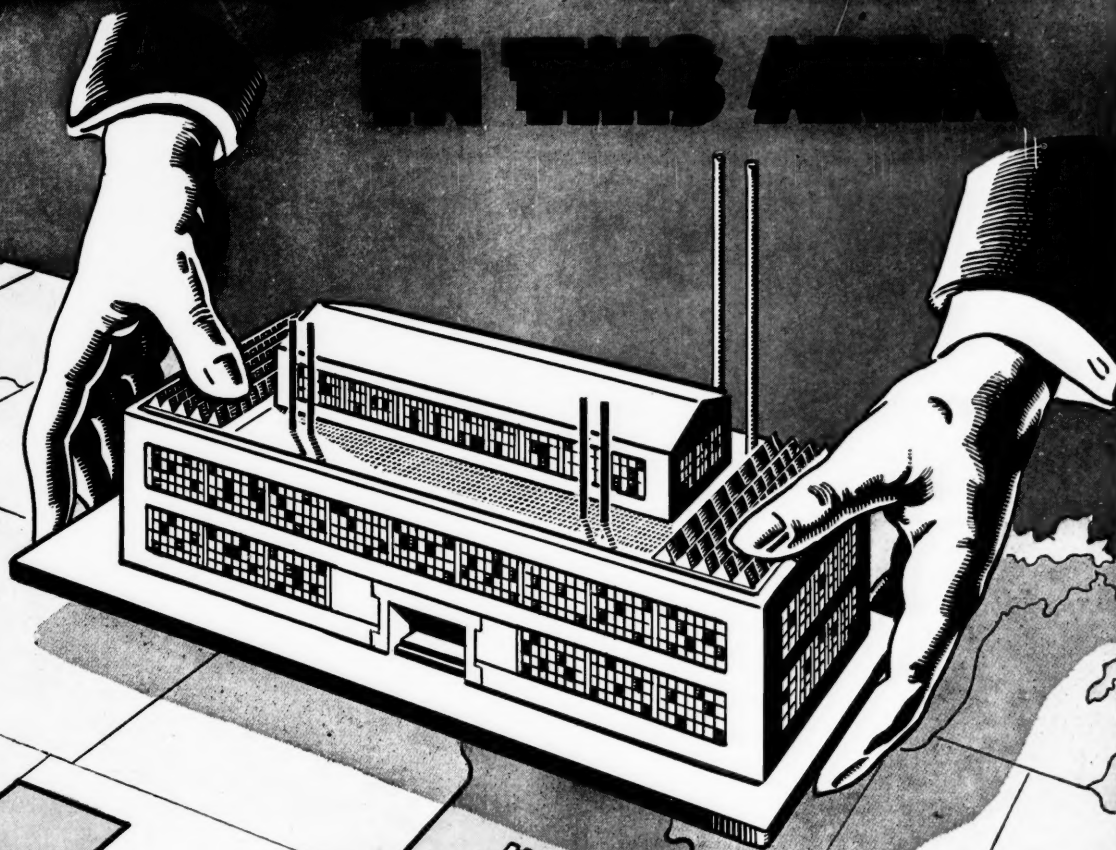
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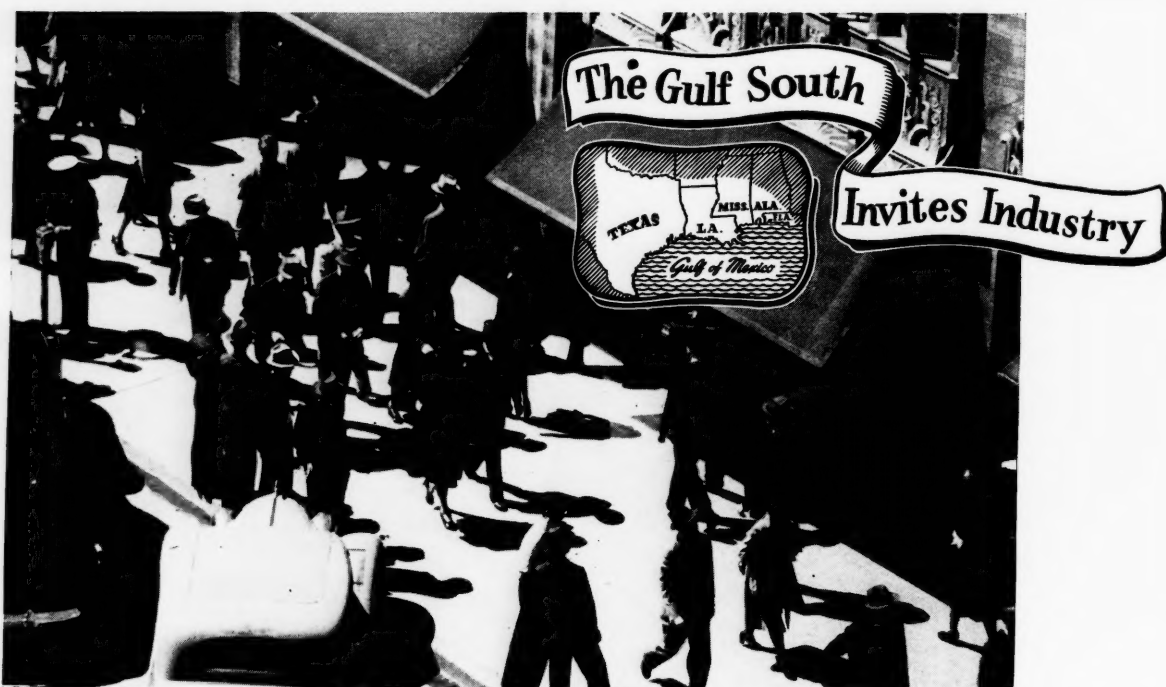
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ments for industrial location in the Gulf South . . . rich supply of raw materials and basic crops . . . complete facilities for shipping and travel by rail, water, highways and air . . . ample power . . . direct outlets to Pan-American and world markets . . . native, white, reliable, intelligent labor . . . abundant Natural Gas, the No. 1 industrial fuel . . . plentiful land, good schools, pleasant year 'round climate.

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ALL INQUIRIES CONSIDERED CONFIDENTIAL



This sketch shows gas-fired steel forges in operation in a Gulf South foundry. Flexible, efficient Natural Gas gives this region an unparalleled advantage in the technic of industrial heat application.

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**Expeditious, Efficient, Dependable Service**

### ***Trackage in 12 States***

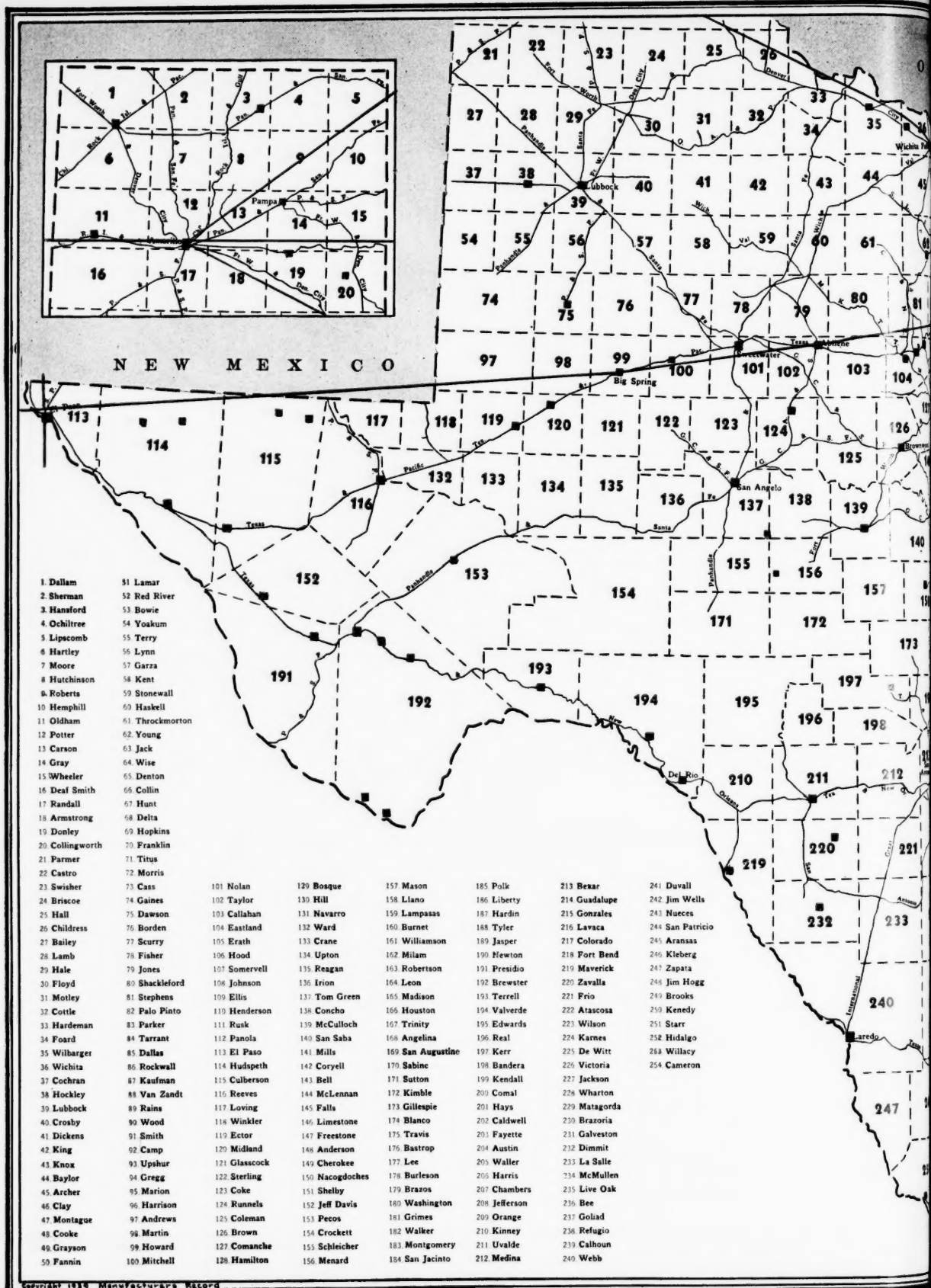
<b>Arizona</b>	<b>Illinois</b>	<b>Louisiana</b>	<b>New Mexico</b>
<b>California</b>	<b>Iowa</b>	<b>Missouri</b>	<b>Oklahoma</b>
<b>Colorado</b>	<b>Kansas</b>	<b>Nebraska</b>	<b>Texas</b>

### ***Many Excellent Industrial Opportunities***

**Please consult any Santa Fe representative about your industrial problems in Santa Fe territory, and you will receive prompt and courteous attention.**

**P. E. TAYLOR, General Industrial Agent, Topeka, Kansas**





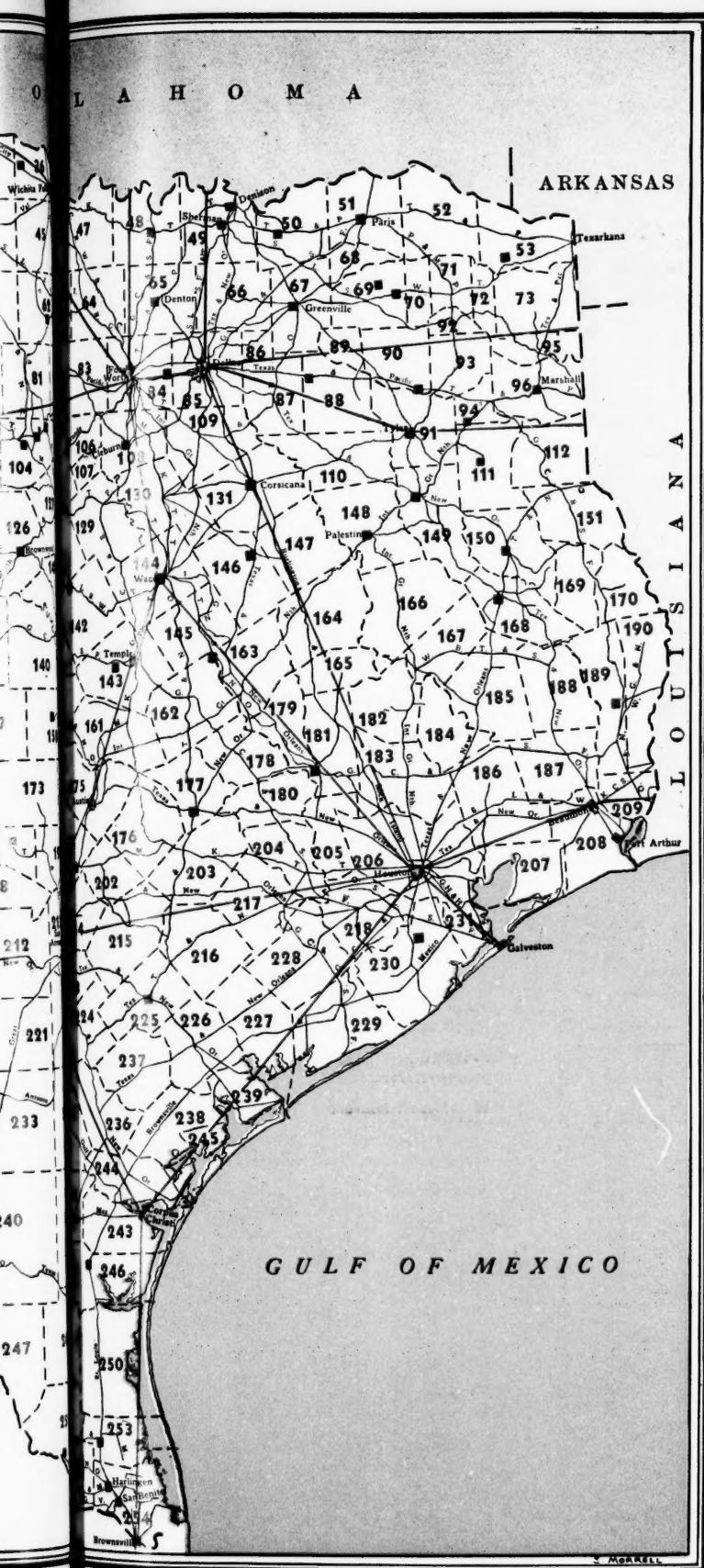
# TEXAS

Its principal raw materials and transportation facilities, with facts on the reverse side pertaining to its industrial growth and opportunities for industry.

## MINERAL

Asphalt—211  
Barite—158  
Basalt—211  
Bentonite—167, 203, 215  
Cement—84, 85, 113, 144, 206, 213  
Clay—12, 36, 39, 48, 53, 64, 65, 69, 71, 73, 79, 82, 84, 85, 89, 90, 93, 96, 102, 109, 110, 113, 114, 125, 126, 131, 144, 145, 168, 176, 203, 206, 209, 212, 213, 214, 215, 218, 219, 240, 251, 252, 254  
Coal & lignite—71, 82, 90, 96, 110, 148, 162, 176, 192, 213, 240

## COUNTIES IN WHICH MINERAL IS COMMERCIALY PRODUCED



**Manganese & manganiferous ore**—152

**Marble**—158, 160, 175

**Natural gas**—3, 12, 46, 47, 49, 57, 61, 62, 73, 74, 80 to 83, 91, 95, 96, 100, 103 to 105, 111, 112, 118, 124 to 128, 131, 138, 148, 151, 154, 155, 162, 164, 166, 183, 188, 193, 194, 205, 206, 212, 213, 217, 219 to 221, 226 to 230, 234 to 244, 247, 249, 251, 252

**Petroleum**—7, 8, 13 to 15, 34 to 38, 44 to 49, 54, 57, 59 to 63, 65, 69 to 71, 73 to 75, 77 to 82, 88, 91, 93 to 95, 97, 99, 100, 102 to 105, 110 to 112, 116 to 119, 121, 122, 124 to 127, 130 to 136, 139, 144 to 151, 153, 154, 161, 162, 166, 168, 172, 175, 176, 178, 180, 183, 185 to 188, 190, 202, 204 to 209, 212 to 215, 217 to 231, 234 to 249, 251 to 253

**Quicksilver**—192

**Salt**—38, 88, 148, 206, 243

**Sand & gravel**—11, 25, 47, 49, 53, 59, 60, 65, 84, 85, 101, 108, 109, 113, 124, 128, 143, 144, 162, 163, 175, 184, 186, 189, 203, 206, 208, 213, 214, 217, 222, 225, 226, 240, 244, 251, 252

**Sandstone**—47, 91, 182

**Silver**—191

**Sodium compounds (natural)**—132

**Stone (miscellaneous)**—49, 85, 92, 105, 114, 241

**Sulphur**—218, 228, 229, 230, 241

#### TIMBER

**Short-leaf pine**—52, 53, 71, 72, 73, 90, 91, 92, 93, 94, 95, 96, 110, 111, 112, 148, 149, 150, 151, 166, 167, 168, 169

**Long-leaf pine**—167, 168, 169, 170, 185, 187, 188, 189, 190

**Loblolly pine**—176, 181, 182, 183, 184, 185, 186, 187, 203, 206, 208, 209

**Post oak**—50, 51, 52, 53, 67, 68, 69, 70, 71, 72, 87, 88, 89, 90, 91, 110, 131, 145, 146, 147, 148, 161, 162, 163, 164, 165, 166, 175, 176, 177, 178, 179, 180, 181, 202, 203, 204, 205, 212, 213, 214, 215, 216, 217, 221, 222, 223, 224, 225, 226, 233, 234, 235, 236, 237

#### AGRICULTURAL PRODUCTS

**Corn**—1 to 10, 13 to 75, 77 to 113, 119, 120, 123 to 131, 136 to 153, 155 to 170, 172 to 192, 194 to 209, 211 to 249, 251 to 254

**Cotton**—3 to 5, 7 to 10, 13 to 114, 116, 119 to 132, 136 to 153, 155 to 192, 197 to 254

**Grape-fruit**—242, 249, 252, 253, 254

**Oranges**—187, 208, 209, 226, 230, 231, 236, 240, 242, 249, 252, 253, 254

**Peanuts**—25, 39, 46, 47, 48, 49, 50, 51, 52, 53, 55, 58, 63, 64, 65, 67, 68, 69, 70, 71, 72, 73, 75, 79, 81, 82, 83, 84, 85, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 103, 104, 105, 106, 107, 108, 110, 111, 112, 126, 127, 130, 140, 146, 147, 148, 149, 150, 151, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 173, 174, 176, 177, 179, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 202, 203, 204, 205, 206, 208, 209, 212, 213, 214, 215, 216, 221, 222, 223, 225, 230, 231, 237

**Rice**—186, 205 to 209, 217, 218, 227 to 230

**Sweetpotatoes**—14, 15, 19, 20, 31, 39, 46 to 53, 63 to 73, 81 to 96, 100, 102 to 113, 116, 126 to 128, 130, 131, 140 to 151, 157, 160 to 170, 173, 176 to 190, 196 to 198, 202 to 209, 212 to 218, 222 to 231, 236 to 238, 249, 252, 254

A small quantity of soy beans, sugarcane, figs, peaches, and pecans is also produced.

**Commercial fisheries**—206, 207, 208, 227, 229, 230, 231, 238, 239, 243, 244, 245, 246, 254

Natural gas is available for consumption in all counties.

— Railroads

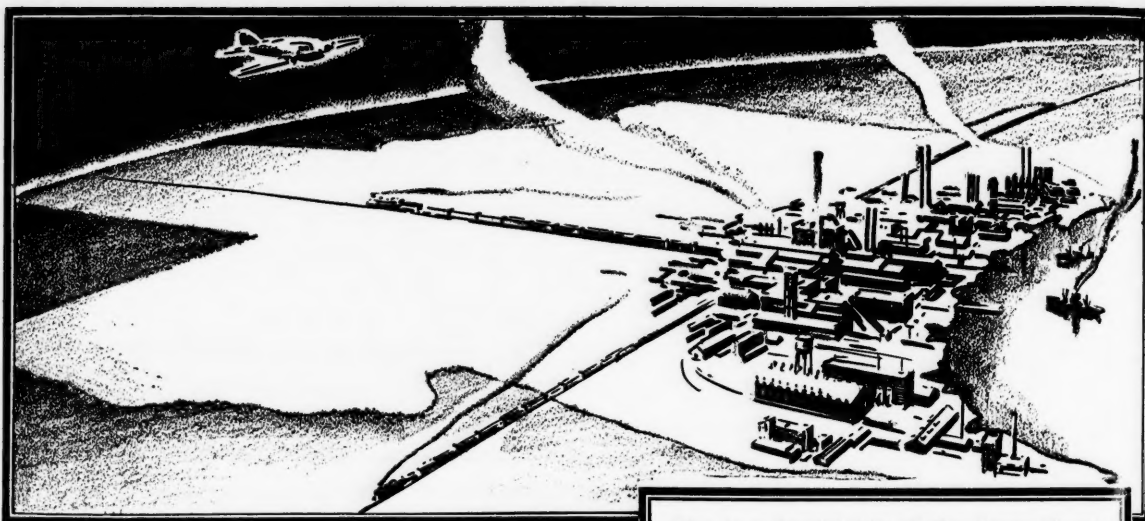
— Navigable rivers

— Airlines

■ Airports—also at principal cities printed in red

**Copper**—191  
**Clay's earth**—168, 182, 203  
**Gold**—191  
**Granite**—113, 158, 160, 173  
**Graphite**—158  
**Opium**—33, 78, 101, 249  
**Silum gas**—12  
**Silver**—191  
**Stone**—85, 113, 161, 175, 200, 206  
**Sandstone**—64, 79, 85, 113, 125, 126, 135, 146, 158, 160, 161, 171, 200, 213 (state obtains limestone from 33 counties)

85, 89, 90, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254



## YOUR COMPANY will profit by investigating the Texas Coast Country's ADVANTAGES OF LOCATION.

. . . and to assist you in making one, we offer you the facilities of our Research Department. Whatever you manufacture, wherever your market is, this Department will gladly prepare for you, without cost or obligation, a confidential survey of the Texas Coast Country, individualized to your company's needs. You will find it carefully engineered, detailed, thoroughly reliable, the kind of report upon which you can base further, personal investigations.

We have undertaken this survey service because, as wholesalers of natural gas, we progress with the industrial development of the region we serve. . . . Address your request\* to Research Department, Houston Pipe Line Company, Petroleum Building, Houston, Texas.

**HOUSTON PIPE LINE CO.**  
Subsidiary of Houston Oil Company of Texas  
Wholesalers of **Natural GAS**

\*Complete surveys usually can be prepared within three weeks or a month. A request for some specific piece of information generally can be answered, however, in a day or two; or by telegram or telephone if your need for it is urgent.

### This is a Partial List of the Texas Coast Country's Industrial Resources.

- 1 **Natural Gas.** The ideal industrial fuel; also a source of raw materials for manufacturers using chemical processes.
- 2 **Sulphur.** Texas leads.
- 3 **Cattle.** Texas leads.
- 4 **Salt or Brine.** Available to Coast Country industries from mines or wells.
- 5 **Fruit and Vegetables.** Numerous sections of the state noted for fine quality of these products.
- 6 **Oyster Shell.** Prolific beds assure an adequate, easily utilizable supply of calcium carbonate.
- 7 **Gypsum.** Available in adequate quantity and quality for chemical use.
- 8 **Sand.** Of numerous types in many different localities.
- 9 **Petroleum.** Texas leads in production and proven reserves.
- 10 **Wool and Mohair.** Texas leads.
- 11 **Forest Products.** A stand of pine which reproduces itself with great rapidity.
- 12 **Metallic Ores.** Easily and economically shipped to coastal points from many Texas sources.
- 13 **Cotton and Cotton Linters.** Texas leads.
- 14 **Limestone.** Available in quantity.
- 15 **Dolomite.** Extensively quarried within easy reach of coastal points.
- 16 **Potash.** Substantial, proven deposits awaiting industrial development.
- 17 **Transportation.** By rail, highway or salt water to every market.
- 18 **Climate.** Mild and equable from one year's end to the next.
- 19 **Local Markets.** Texas cities, Texas farms, Texas industries.
- 20 **Recreational Facilities.** Unexcelled in America.



# Texas—

## And its Vast Mineral Deposits Offer a Wide Variety of Industrial Opportunities

**T**EXAS, popularly known as the Lone Star State and first settled in 1685, declared its independence from Mexico in December, 1835 and elected Sam Houston as president early in 1836 after defeating the Mexican president, Santa Anna, at San Jacinto in April of the same year. Texas was finally admitted to statehood in the Union on December 29, 1845 after some delay caused by trepidation on the part of the North at the prospect of having the number of slave states increased. At the time of admittance, the area of Texas comprised 375,000 square miles but all the territory except that now included within the state borders was ceded to the United States for \$10,000,000 in 1850. The resolution of annexation gave Texas the right of subdividing into as many as four states providing each of the new states could meet the population requirements of the United States.

The area of Texas, amounting to 265,896 square miles including 3,498 square miles of water, is more than eight per cent of the entire country and ranks first in size while its population, estimated at 6,147,000 in 1937, places Texas fifth in rank among the States. The negro and Mexican population is approximately 15 and 10 per cent respectively.

### Climate

**T**HE geographical size of Texas is such that it is difficult to approximate climatic conditions and averages. In spite of this fact, however, it may be said that while generally mild, Texas climate is subject to rapid and marked changes of temperature especially during the winter, though the extent to which these changes occur varies in different parts of the state. The average annual temperature for the state is 64.8 degrees Fahrenheit varying from an average of 58.8 degrees Fahrenheit in the northwest to an average of 68.2 degrees Fahrenheit in the southwest. Throughout the state July is the warmest month with an average of 82.2 degrees Fahrenheit and January is the coldest with a low average in the northwest of 38.1 degrees Fahrenheit.

Rainfall is extremely varied. In the northwest the average is 20.54 inches; in the northeast, 33.42 inches; in the southeast, 35.84; and in the southwest it varies from 27.98 to 7.66 inches. Snowfall ranges from an average of 1.1 inches in the southeast to 10 inches in the northeast.

### Transportation

**T**HE total road and highway mileage in Texas as of December 1939 aggregated approximately 188,700 miles. Of this, 23,100 miles are under the jurisdiction of the State Highway Department and include 11,828 miles with asphalt surface, 5,268 miles (exclusive of 595 miles in cities) of concrete and brick surface, 1,892 miles surfaced with gravel, caliche, etc., and slightly more than 3,500 miles of graded and unimproved. The remaining mileage of more than 166,100 miles are county roads of which over 750 miles are concrete or brick, over 4,000 miles have a bituminous surface, approximately 22,000 miles are

surfaced with soil, gravel, or stone, 13,730 miles are graded and drained, and the remaining mileage is unimproved.

Throughout the eastern part of the state from north to south there are numerous bus and motor freight services connecting all the principal cities.

The number of miles of railroad trackage in Texas approximates 18,000 miles including that operated by switching and terminal companies. Almost 90 per cent of this mileage is operated by 20 Class I railroads of which more than half are major lines. Altogether, 70 railroad companies operate mileage in Texas—15 Class II roads, 22 Class III roads, and 13 switching and terminal companies.

With a general coast line of 367 miles on the Gulf of Mexico, Texas has extensive water transportation facilities. Channels of 25 feet or more in depth extend to Orange, Beaumont, Galveston, Houston, Freeport, Corpus Christi, and Port Isabel. The intracoastal canal from Corpus Christi connecting Texas with eastern and northern states provides an uninterrupted channel of nine feet or more deep with numerous harbor channels of similar depth enroute. An indication of the shipping facilities in Texas is found in the value of imports and exports in 1938. Imports through the Galveston district which includes Houston, Galveston and Texas City totaled \$25,626,201 and exports \$276,287,762. Through the Sabine district which includes Port Arthur, Sabine, Beaumont, Orange, and Lake Charles, La., imports and exports amounted to \$2,013,044 and \$84,830,623 respectively, and through the San Antonio district which includes San Antonio, Corpus Christi, Brownsville, Eagle Pass, and Laredo, imports were valued at \$5,584,203 and exports at \$69,657,452. Ample wharfage with railroad connections and extensive coastwise and foreign ship lines makes Texas a focal point for both domestic and international marketing.

Operating in or through Texas are 13 domestic air routes under the control of eight different companies and exclusive of an air line to Mexico and South American countries. With 133 airports and landing fields strategically located throughout the state, Texas ranks second among all the states.

### Manufactures and Finance

**T**HE value of all manufactured products in 1937 was \$1,581,422,401, representing an increase of nearly 50 per cent over the \$1,059,245,252 figure for 1935. In the same period the number of wage earners increased 30,377, wages rose \$42,302,901, and the cost of materials, etc. increased from \$764,117,513 to \$1,141,567,954.

Among the 109 industries listed separately in the census reports with three or more establishments each, 40 have products valued at more than a million dollars. Petroleum refining ranks first with products valued at \$689,625,304. Other leading industries with the value of their products for 1937 are: meat and poultry packing, \$104,934,256; machinery and allied products, \$71,559,533; flour and other grain mill products, \$62,873,757; cottonseed oil, meal and cake, \$52,322,363; printing and publishing, \$42,600,772; bread and bakery products, \$35,-

019,601; lumber and timber products, \$28,367,805; clothing and hats, \$23,653,842; shortenings (other than lard), \$21,330,543; non-alcoholic beverages, \$19,731,785; cotton woven goods, \$14,802,905; bone carbon and lamp black, \$14,516,343; canned fruits and vegetables, \$14,366,609; butter, \$12,775,339; rice cleaning and polishing, \$12,392,470; cement, \$12,137,472; and bags (other than paper) \$11,016,722.

In the state's 4,422 establishments 129,501 people were employed with a payroll of \$132,505,115.

The aggregate resources of the 844 banks reporting to the Comptroller of the Currency on June 30, 1939 totaled \$1,661,158,000. The capital stock of these same banks including capital notes and debentures amounted to \$97,142,000 while \$1,471,897,000 was in individual deposits. The total bank clearings of 13 reporting exchanges was \$6,881,980,000, an increase of \$415,094,000 over the amount of business transacted in 1938. Federal tax receipts for the calendar year 1939 totaled \$132,887,383.

## Agriculture

**T**HE total cash farm income for Texas in 1939 was \$567,596,000 including \$223,515,000 from crops and \$333,326,000 from livestock and livestock products. The crop income was derived from a large variety of products grown on 25,122,100 acres. Cotton was the major crop with 8,608,000 acres yielding 2,830,000 bales and having a cash income of \$120,862,000 in addition to \$17,538,000 from 1,258,000 tons of cottonseed. Other important crops were: 27,650,000 bushels of wheat with a cash income of \$17,911,000; 13,988,000 bushels of rice yielding \$9,111,000; 73,376,000 bushels of corn provided a cash income of \$3,874,000; \$1,985,000 was derived from 28,750,000 bushels of oats; 177,205,000 pounds of peanuts yielded \$3,262,000; and 19,000,000 pounds of pecans yielded \$1,390,000.

Livestock is an important feature of Texas agriculture and the value of 20,377,000 head of livestock in 1939 was \$350,482,000. Making up this total were 6,677,000 cattle (including 1,443,000 cows and heifers kept for milk) worth \$199,782,000, and 10,069,000 sheep valued at \$49,413,000. The cash farm income from dairy produce amounted to \$64,385,000 in 1939, made up of \$42,267,000 from milk, \$16,978,000 from eggs and \$5,140,000 from chickens. Factory production of dairy products in 1938 included 36,829,000 pounds of butter, 32,592,000 pounds of evaporated milk, and 24,182,000 pounds of cheese.

In 1938, production of oranges amounted to 2,815,000 boxes and grapefruit numbered 15,670,000 boxes. Oranges average 90 pounds per box and grapefruit 80 pounds.

## Fisheries

**T**HE total catch of all commercial fish on the Texas Gulf Coast during the past year was 18,656,867 with an estimated value exceeding \$3,500,000. Outstanding among the varieties caught was shrimp amounting to 12,563,726 pounds while other major species were: drum, 1,649,504 pounds; trout, 1,380,369 pounds; oysters, 938,798 pounds; redsnapper, 1,170,517 pounds; and redfish, 524,122 pounds. Conservation measures which have been passed on various occasions include operation of ten patrol boats to check legal tackle requirements, prevent illegal netting in closed waters, and to insure the catch is in conformity with the law as to size. More recently, a Diesel electric hydraulic dredge has been acquired to open and maintain channels connecting the Gulf with inner bays for the better protection of young shrimp, redfish, drum, etc.

## Timber

**T**EXAS has a forested area of 35,000,000 acres of which 10,552,600 acres are classified as the commercial timber belt. The balance, or approximately 24,000,000 acres, is classified as protection forests which serve their highest purpose by assisting in the control of water run-off and greatly reducing erosion. The predominate species identified to the protection forests are post oak, cedar, mesquite, and live oak. There are, however, scattered through this region many tree species that are commercially valuable to the forest products industry. For the present, timber in the protection forest area is used for posts, fuelwood, and rough construction purposes. With the advancement of chemical utilization of wood fiber, post oak and cedar especially may prove to be valuable in the future for this industry.

Of the 10,552,600 acres of commercial timber land in East Texas 7,256,600 acres are in pine (shortleaf, loblolly and longleaf) and 3,296,100 acres in mixed hardwood species. In this

region 7,061,000 acres contain trees of sawtimber size and the balance, 3,491,600 acres, is under sawlog size, the total volume being 28,221,900,000 board feet, including 18,327,600,000 board feet of softwood and 9,894,300,000 board feet of hardwood. Of this total, old growth on 690,800 acres accounts for 2,133,700,000 board feet of softwood and 2,736,600,000 board feet of hardwood, while second growth volume on 6,370,200 acres containing sawtimber size trees consists of 15,456,100,000 board feet of softwood and 7,078,600,000 board feet of hardwoods. The balance of the volume, found mainly in second growth stands under sawlog size, totals 816,900,000 board feet for pine and hardwoods combined.

Yellow pine is easily the leading variety, amounting to 18,129,600,000 board feet, and cypress is the only other softwood growing in any quantity, with 198,000,000 board feet. Among the hardwoods are: 5,001,100,000 board feet of oak, 2,058,700,000 board feet of red gum, 920,800,000 board feet of black gum and tupelo, and 1,913,700,000 board feet of other hardwood species.

The East Texas timber belt estimated on a cordwood basis shows 152,744,200 cords, distributed as follows: 46,727,200 cords in trees under sawlog size, 65,505,700 cords in sawlog material of sawlog size trees, 21,125,900 cords in topwood of sawlog size trees, and 19,385,400 cords in defective trees not suitable for sawtimber. About 45 percent of the cordwood volume is in pine species and 55 per cent in hardwoods. Approximately 98,000,000 cords are in species which have so far proven suitable for pulping. Excluding the nonpulping species and sawlog material in trees of sawtimber size the available pulpwood volume totals about 60,000,000 cords.

The Texas Forest Service has in the commercial timberbelt over 11 million acres under organized fire protection. Inside this area 70 towers and over 1,800 miles of telephone line have been constructed to assist the personnel in its protection activities.

## Mining and Minerals

**M**INEROLOGICALLY, Texas is a wealthy state and the value of its annual output, which in 1937 was \$813,270,605, exceeded the next highest state by almost 35 per cent. On the accompanying map are indicated those minerals now being commercially produced. But in addition to the latter, there are other known commercial deposits of many of these minerals while a vast quantity of untouched minerals await further exploration and production.

Reserves and new fields of petroleum and natural gas are constantly being increased and constitute a vast supply for the future.

Commercial deposits of coal and lignite are estimated at eight and thirty billion tons respectively, forming a fuel reserve of industrial importance.

Iron ores exist in two distinct localities. In the central part of the state are located the hematite and magnetite deposits largely confined to two or three counties around Iron Mountain. The most important deposits, however, are the limonite ones in the eastern Texas geosyncline embracing over 20 counties. Commercial economical development of these ores is now regarded optimistically with use of natural gas in place of the usual coke and fluxing limestone.

Additional salt domes producing singly or in conjunction salt, sulphur, and oil have been proven but are not yet in production.

There has been some feldspar produced in Llano county, and it is known to exist in Mason, Burnet, Gillespie and Blanco counties, all in the central section of the state.

Although up to this time there has been very little production, magnesite is to be found in Llano and Mason counties.

There is a possibility that the celestite present in Nolan and Brown counties justifies commercial development, especially since it has been reported from many other counties of central Texas.

The University of Texas Bureau of Economic Geology has received samples of gilsonite from Brewster county, but to date nothing is known concerning the quantity present. There is also novaculite in this county.

Some of the mines in Hudspeth and Presidio counties contain fluorite as a gangue mineral in ore veins. Diatomaceous earth is present in Crosby county.

At the present time tripoli is being produced in small quantities in Lampasas county, and is also known to be present in Burnet, Blanco, and San Saba counties.

Volcanic ash is found in many different counties which are scattered all over the state and occurs in great quantities.

Quartz is found in two main regions, in Llano, Burnet, Mason, Gillespie, and Blanco counties in the central part of the state, and in Hudspeth and Culberson in the western portion. Arsenopyrite is present in Llano and El Paso counties.

The Eocene rocks of the Gulf Coastal Plain contain large

amounts of gresand while small quantities of vermiculite have been reported in Llano and Mason counties. Samples of chromite have been brought in from Gillespie county, but as yet, the amount present is unknown.

There are mica deposits in Hudspeth, Culberson, Mason, and Llano counties and the Permian basin of west Texas contains potash but exploration is required to determine both quantity and quality.

### Electric Power

**P**RODUCTION of electric power by public and private plants in Texas during 1939 totaled 3,751,868,000 kilowatt hours, an increase of 290,041,000 kilowatt hours over the total for 1938. Of this total, 3,621,125,000 kilowatt hours were produced by fuel plants, and but 130,743,000 kilowatt hours came from hydro-electric plants.

At the end of 1939, the 204 plants had a combined generating capacity of 1,105,216 kilowatts. There were 128 internal combustion plants, with an installed capacity of 87,989 kilowatts, 54 steam power plants, with an installed capacity of 901,589 kilowatts, and 22 hydro-electric plants having a capacity of 70,795 kilowatts. Both generating capacity and production of electricity in Texas is increasing with demand but meanwhile, an adequate supply is available by means of connecting systems with adjoining states which latter produce a surplus of five to ten percent beyond domestic requirements.

### Taxation

**A**LL corporations, domestic and foreign are required to pay annually a state franchise tax at the rate of 60 cents per thousand between one dollar and one million dollars; beyond a million the rate is 30 cents per thousand. The tax is based upon that portion of a corporation's outstanding stock, surplus and undivided profits, plus amount of outstanding bonds, notes and debentures, as the gross receipts from business done within the state bears to total receipts of the corporation's entire business. The minimum tax is \$10.

Taxes on gross receipts and intangible assets are imposed on various kinds of corporations.

Sulphur is taxed at the rate of \$1.03 per long ton; carbon black is taxed 1/12 of one cent per pound where the market value is four cents or less per pound and where the market value exceeds four cents the rate is 3 per cent. Gas produced and saved within the state or imported is taxed 3 per cent of market value. Marble and cinnabar ore are taxed ten cents per ton and other ores are taxed five cents per ton.

Oil produced in the state is subject to a tax of two cents per barrel or 2 per cent of market value if the price exceeds one dollar per barrel. There is also an additional tax of 3/16 of one cent on each barrel.

The total assessed value of taxable property in 1939 was \$4,213,395,437. County tax rates vary from a low of 28 cents to a high of \$1.80.

### Labor and Wages

**T**HE density of population of Texas is 22.2 per square mile and only 41 per cent is classified as urban. Almost 17 per cent of the state's entire population is located in the nine cities of Austin, Beaumont, Dallas, El Paso, Fort Worth, Galveston, Port Arthur, San Antonio, and Waco. Native whites comprise 73.5 per cent and foreign born only 2.3 per cent.

The average wage rate for the state as a whole in all manufacturing industries is 59.2 cents per hour. In the various food industries the average rate is slightly above 40 cents and only a few fall below, varying from 29.8 cents to 36 cents. In the textile field averages range from 31 to 39.9 cents with a state average for the entire industry of 34.1 cents an hour. Among forest products industries rates vary from an average of 25.8 cents to a high of 48 cents, the state average being 39.6 cents per hour. Average wage rates in printing and publishing range from 56 to 97 cents per hour; cotton oil mills, 31.2 cents; paper products, 49.2 cents; foundry and machine shop products, 63.5 cents; miscellaneous machinery and iron and steel products, 57.5 cents; cement, 58.9; and stone and concrete products, except bricks, 58 cents. Crude petroleum production, employing about 30,000 workers, averages 94.7 cents and petroleum refining in which approximately 20,000 people are engaged averages 93.9 cents per hour. Carbon black production averages 84.4 cents, and paints and varnishes average 51.7 cents an hour.

Labor in Texas is intelligent and loyal and an ample supply is available in virtually every part of the state. Of the state's 254 counties, 219 support one or more manufacturing establishments.

## IDEAL TERRITORY FOR PLANT LOCATION

Your plant relocation problem, or that of establishing a branch plant or warehouse, will be simplified by placing the question in the hands of our Industrial Engineers and Technologists for analysis.

Facts, and not opinions, will be presented to prove why a certain area or locality in Missouri Pacific Lines territory in the Central West and

Southwest would best meet  
all of your require-  
ments.



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**J. G. CARLISLE**

Director of Industrial Development

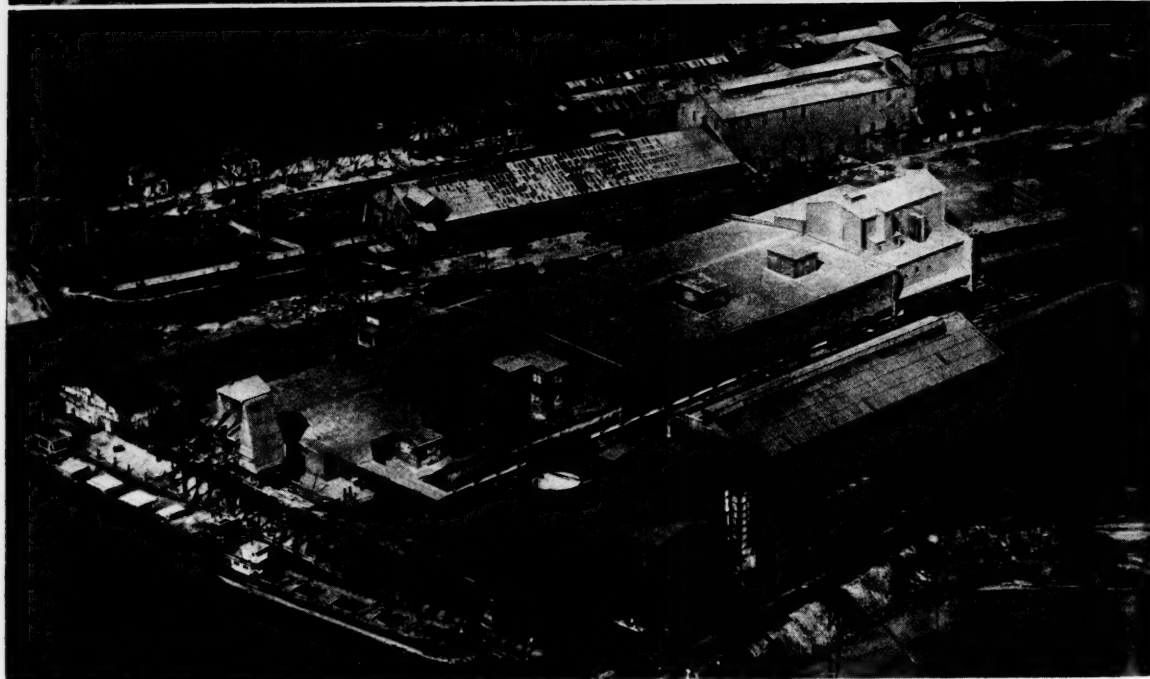
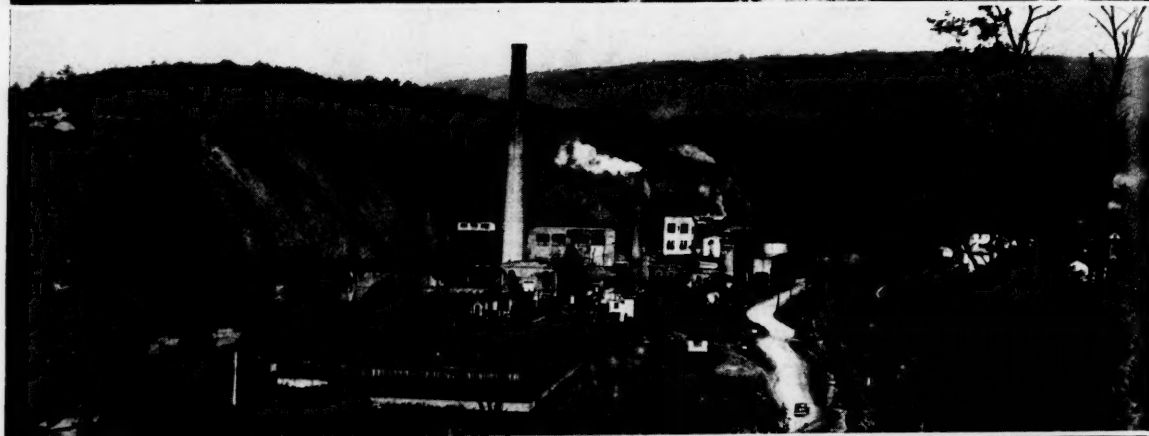
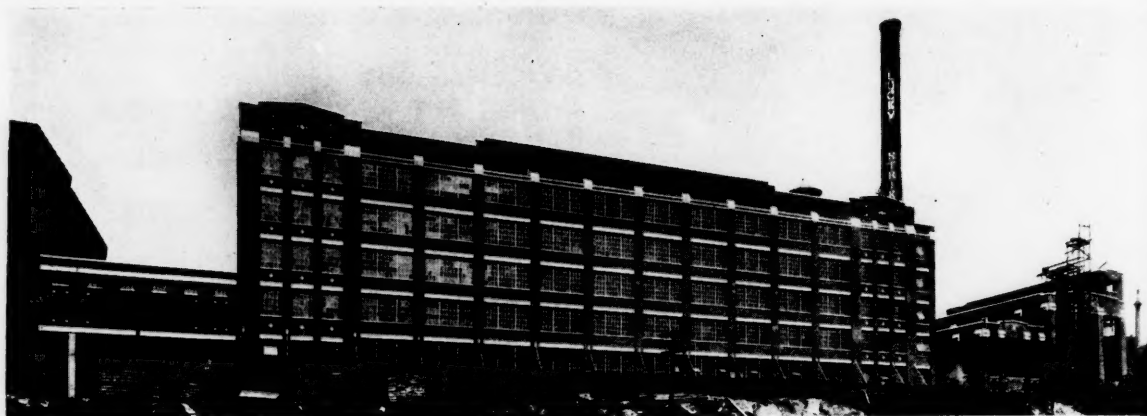
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*Top—The American Tobacco Company's Lucky Strike plant at Richmond is one of Virginia's largest tobacco manufacturing establishments, the entire state industry having an output in 1937 valued at almost \$300,000,000. Center—As a producer of pulp and paper, Virginia has always ranked high among the southern states; this mill of the West Virginia Pulp and Paper Company at Covington is among the largest in the state. Bottom—Fertilizer manufacturing, which had an output valued at more than \$20,000,000 in 1937, is one of Virginia's ten largest industries. This plant of the Royster Guano Company is strategically located on tidewater at Norfolk.*

# VIRGINIA



*The chemical industry in Virginia is represented by many plants with products annually valued at more than \$30,000,000. Here is part of the Solvay Process Company's establishment at Hopewell.*

## THE PAST AND FUTURE OF INDUSTRY IN VIRGINIA

### I. Introduction

IN planning for the industrial future of Virginia it is first necessary to have a knowledge of basic trends and historical developments, in order to understand the influences and traditions which have resulted in the present industrial situation. It is also necessary to have accurate information as to the resources of the State, to determine their potential benefits, and to ascertain their limitations. Considered from an industrial point of view, these resources are divided into five classes: material resources, power resources, topographic and climatic conditions, manpower (both managerial and operative), and markets, together with means of transportation and distribution related to these markets.

BY

**William H. Fisher**  
Special Assistant,  
Virginia State Planning Board

The future application of this information must be thought of in terms of the ultimate production of new and distributable wealth, this production to be obtained with the maximum of social and economic good to the State and with the minimum of harmful social effect. These two conditions necessitate thoroughgoing and scientific planning as the tool of those most directly concerned with industrial patterns within the State.

With this in mind, the purpose of this

paper may be considered to be a review of the industrial development of the State, with some suggestion as to current and planned programs.

### II. Historical Development and Evolution of Virginia as an Industrial Center

The tradition of Virginia has been largely agricultural. The most important factors, from an historical viewpoint, which directed development along agrarian lines were: first, the prohibitions and restrictions placed on Virginia by the British government during the time Virginia was a Crown Colony; second, the institution of slavery; and, last, the period of the War Between the States, with its destruction of capital and manpower and



with its sequel, the Reconstruction Period.

The early history of industry in Virginia centers in colonial Jamestown. Between the years 1608 and 1611 the Jamestown settlement began the manufacture of pitch, tar, glass, soap, and timber products. The industrialization of the new Colony suffered many setbacks before finally gaining sure footing, primarily because of the growing emphasis on tobacco culture, but also because of the frequent loss of craftsmen and machinery by Indian massacre. As for the rest of the Colony, there were large, self-sufficing plantations which manufactured all that they needed. The later Colonial Period saw the beginning of shipbuilding, tanning and allied production, the expansion of iron and other mineral extraction west of the Blue Ridge and the growth of textile manufactures, some of which, however, were greatly restricted by Crown decrees.

During the period of the American Revolution and the first half of the following century, Richmond became of first importance as a manufacturing center, with iron foundries, flour mills and tobacco houses sharing the limelight. Throughout the rest of the State the growth of slavery brought a stronger shift to agriculture. Other features of this period were the development of the eastern coal-beds between 1830 and 1840 and the revival of lead and salt mining in the southwestern section of the State.

The period of the Confederacy and Reconstruction found the counter-forces of expansion and destruction at work throughout the South. The Confederacy attempted to be self-sufficient in all manufacturing, but with little success. The Northern armies destroyed a great deal of the machinery and productive capacity of the South, and especially of Virginia. In general, it can be said that in Virginia cotton goods, tobacco and flour industries expanded rather well during the period following the war, which saw most other industries declining.

The later years of the 19th Century were

years of all-around industrial expansion for Virginia. In Richmond this expansion took place on a relatively large scale, with existing industries growing and new ones coming in. The introduction of iron foundries, textile and woodwork mills began a train of industrialization which, coupled with the later coming of railroads and other heavy industries, caused a small community to grow into the present city of Roanoke. Booming tobacco markets, processing plants and textile mills caused the rapid rise of Danville as an industrial center for the southern border section. Iron mills and the Norfolk and Western Railroad had a similar effect in the central section, particularly at Lynchburg.

Between 1900 and the present, the increase of industries in Virginia has proceeded rapidly and the State, while still extensively agricultural, is assuming its place as a well-rounded industrial center for the Atlantic Seaboard. During the past decade, the manufacture of tobacco products, paper and pulp, steam railway equipment, furniture, chemical products, grain and food stuffs, structural iron work, printing, and allied lines have accounted for approximately 70 per cent of the Virginia output. In 1937, the last year for which complete United States Census of Manufactures figures are available, the total value of manufactured products for the State was \$908,222,000. The growth during the ten years ending then represents an increase of 35.3 per cent for Virginia, as contrasted with a decrease of 3.6 per cent for the rest of the United States (Virginia excluded).

### III. The Basic Principles of Sound Industrialization

In looking toward the future, Virginia is concerned with determining what types of industries will best contribute to a balanced economic pattern for the State. As yet, there is no complete body of data which can be used as the basis for such a determination. The Virginia State Planning Board, vitally interested in this question, has collected much pertinent basic data, and has cooperated fully

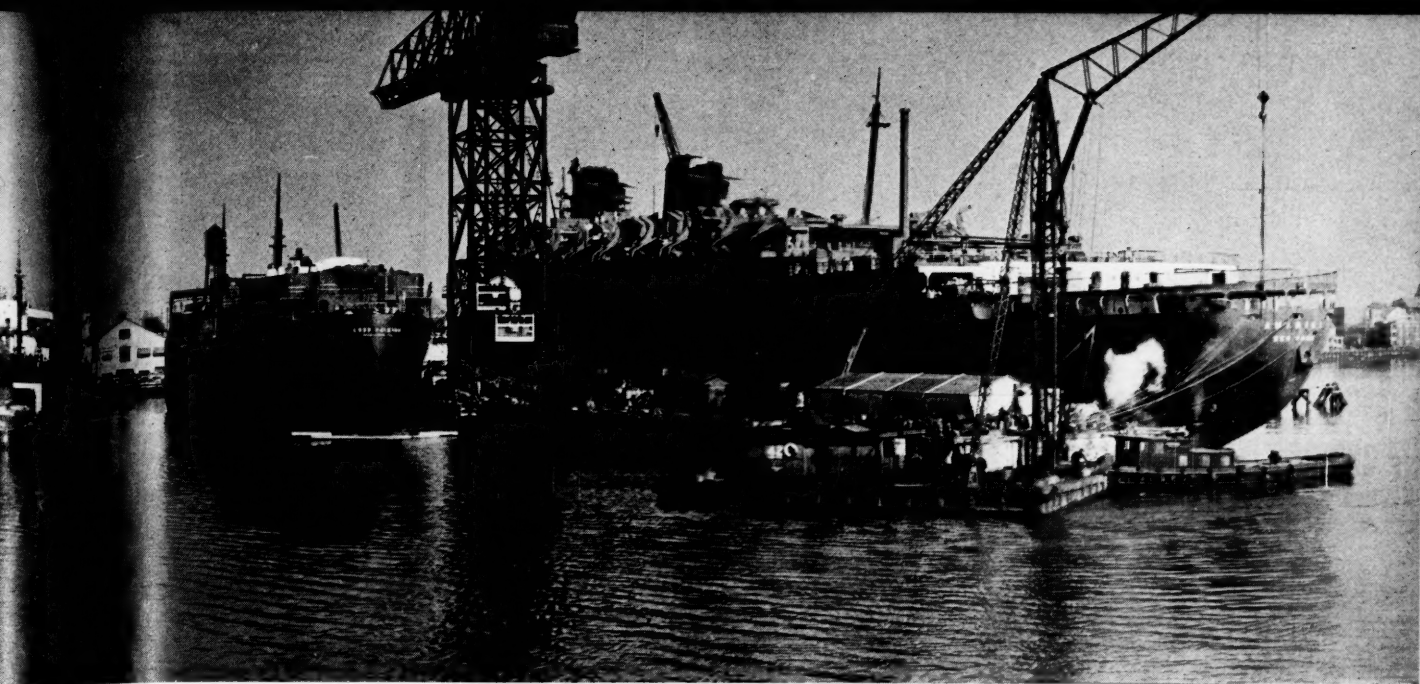
*One of the world's largest and best equipped shipbuilding plants is the Newport News Shipbuilding & Drydock Company establishment at Newport News. This scene is of the fitting-out basin showing on the extreme right the S.S. America, largest liner ever built in the United States. On the left can be seen the cranes of the shipbuilding ways.*

with all public and private agencies interested in this phase of State development. The most promising possibility of an answer lies in a comprehensive study of population in relation to the economic resources of the State, both agricultural and industrial, which is now being undertaken jointly by the State Planning Board, Virginia Polytechnic Institute and the University of Virginia, with the aid of a grant of funds by the Rockefeller endowed General Education Board. This study, which will extend over about three and a half years, should make it possible to determine what types of industrialization should be sought for the State. Pending the completion of this study the best that can be done is to attempt to outline the principles which should govern the choice of future industries.

The late Major Charles J. Calrow, then Consultant-Director of the Virginia State Planning Board, discussed planning for industrial development in his introduction to Part V (Industries) of the Planning Board Reports. Quoting from this report: "The creation and operation of industries are the result of some forms of planning, usually individualistic and based on the desire for individual profit. This planning has, in many cases, led to the setting up of destructive operations, destructive to the thing planned as well as to related interests." "The errors in individual planning have, in a large measure, been repeated in the community industrial planning. Here competitive promotional efforts have produced results not always good for the community or the industry and it is to this phase of planning that greater attention needs to be paid."

"Planning by the locality and the State . . .





has nothing in common with the so-called 'regimentation' of industry, and between this type of planning and the planning by the individual industry, there need be no conflict."

Virginia is anxious that the State shall enjoy the benefits of a sound and balanced economy — an economy in which all classes, worker, operator, farmer and consumer, receive the most at the least cost. Industry plays a great part in this balance, but sight must not be lost of the agricultural foundation on which Virginia and the nation still must rest. Thus, a balanced economy is not a purely industrial economy, but one in which agriculture and industry mutually buttress each other. With this in mind, it becomes increasingly apparent that the use to which land is put is of basic importance. Agriculture is still the primary land use of America. There is no such thing as marginal or sub-marginal land, but only marginal and sub-marginal land uses. More study is required to determine the optimum land use for the various parts of Virginia. The study being made jointly by the Virginia State Planning Board, Virginia Polytechnic Insti-

tute and the University of Virginia, of population trends, agricultural economy, and industrial economy, referred to above, will do much to supply this need.

The industries which undertake to supplement a deficient agricultural economy by sound industrial development must take into consideration the seasonal variations in available agricultural labor, and should attempt also to supplement existing industries. In the past the approach to this problem in many instances has been, as Major Calrow indicated, promotional and indiscriminate, with the selection of industry and its location left largely to chance and to the entrepreneur's desire for profit. This type of action is likely to lead to a concentration of families of low income, resulting in slums, impaired health and other evidences of inadequate levels of living, in opportunity for exploitation of the labor sup-

ply, and in a tendency toward disintegration of the morale and the moral fiber of the community. At the same time existing social and cultural characteristics of the community may be uprooted and no worthy replacement be made.

Zoning and other measures of physical planning, though they have far to go, show promise of improving the situation by encouraging the best use of the land and assuring and protecting a desirable character for residential neighborhoods.

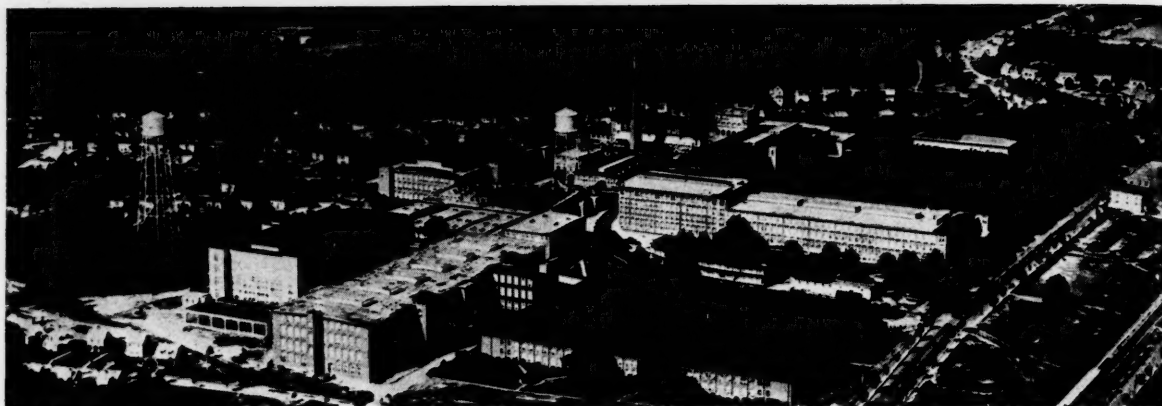
To sum up the foregoing, it may be said that industrial planning for any locality should be concerned with the economic and social needs of the region, the state and the local community, and with the potentialities for a balanced economy for each. It is also desirable that the economic dependence of the employee be as completely decentralized as possible.

#### IV. Characteristics of Desirable Industries for Virginia

The scope of possible industrial expansion within Virginia is extensive. On a basis of natural offerings as to raw materials, topog-

*Like the adjoining state of North Carolina, Virginia has a large furniture industry with an annual output exceeding \$30,000,000. Pictured here are the furniture factories in Martinsville.*





raphy and power facilities, there are wide possibilities. If those industries which can supplement, or utilize the by-products of, existing or potential industries are included, the list grows even longer.

As to actual type and form of industry it can be said that there is need for: first, many small, decentralized, craft-industries which will supplement agricultural employment and bring with them the increased morale of the skilled tradesman, and which, by their very nature, are inductive to economic stability; second, a smaller number of medium-sized, single plants, located in or near small population centers, close enough together for the security of the labor supply, and balanced with respect to each other where seasonal variations are concerned; third, a relatively small number of

*The Riverside Dan River mills is the largest of Virginia's cotton textile plants—an industry of over \$30,000,000 output to rank among the state's five largest industries.*

large single or multiple-unit concerns, preferably situated in or near metropolitan areas. These plants should preferably cross-utilize mutual intermediary products.

The following undesirable results should be avoided: uncontrolled stream pollution; the development of over-dependence of any community on any one industry; wasteful and unscientific depletion of irreplaceable mineral reserves or use of replaceable forest or marine reserves with no attempts at scientific conservation and replacement; and finally, the exploitation in any way, financial, social or in

work-environment, of the personnel involved.

Virginia offers broad industrial possibilities. The saturation point has nowhere been reached. Many fields are virtually untouched. The State needs and can absorb, with mutual profit, a wide variety of industries. But these industries, to be welcome, must be planned. They must be planned with especial consideration of location, personnel, training required by operatives, raw materials, waste products, and the social well-being of the State as a whole. For the goal will not have been reached until every industry, no matter of what kind or size, is fitted into a balanced economic pattern for the region, State, and local community, and is not set down in a haphazard manner, or designed with quick profit as the principal motive.

## Plant Location

When making surveys and studies from material appearing in the pages of this issue of "The South's Resources," supplementary material may be obtained from advertisers who offer to be of service.

Nearly sixty years of concentration on the South enables the MANUFACTURERS RECORD to assist in many instances.

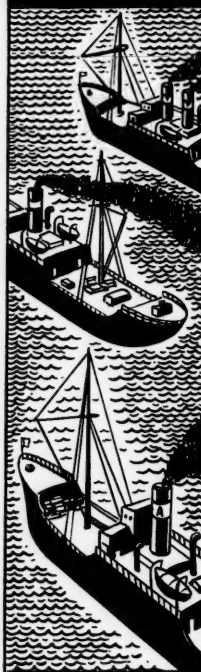
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# Virginia—

## Resources and Industrial Opportunities

**V**IRGINIA, one of the original thirteen states and called the "Old Dominion," contains the site at Jamestown of the first permanent English settlement in America, having been settled in 1607. Named Virginia by Queen Elizabeth, it is interesting to note that the name was applied upon presentation of a favorable report of what is now the North Carolina, not Virginia, coastal region by Amadas and Barlow, the two emissaries of Sir Walter Raleigh to whom had been passed in 1584 the land patent originally granted to Sir Humphrey Gilbert. The first "Charter of Virginia" was granted to the Virginia Company by James I in 1606 and was so governed until 1624 when the charter was revoked and Virginia became a royal colony, continuing as such until the Revolution.

Thirty-third in size with an area of 42,627 square miles of which 2,365 square miles are water, Virginia ranks twentieth in population with an estimated 2,706,000 in 1937. The negro population comprises 26.8 percent of the total.

### Climate

**B**ECAUSE of its varied topography ranging from the coastal plain region in the east and south to the mountains of the west, the climate of Virginia embraces distinct differences. In the north and west portions of the state the winters are rigorous but not severe and the summers are warm with the temperature seldom exceeding 90 degrees Fahrenheit. The average annual temperature is 54.1 degrees Fahrenheit. The precipitation is abundant and usually well distributed with an average annual rainfall of 38.64 inches. Snowfall is relatively heavy in winter especially in the west averaging approximately 30 inches.

In the southern part of the state the summers are long and warm with mild winters except in the mountains. The average annual temperature is 56.5 degrees Fahrenheit and the rainfall average is 43.03, the heaviest rain falling during the growing season of April to September, and November is the driest month. The snowfall averages 12.5 inches.

### Transportation

**I**N January 1939 the Virginia highway system was made up of 45,734 miles of road. Three counties not included in the State system had an aggregate of more than 560 miles of public roads. The aggregate linear road distance of 46,295 miles was made up of the following general types:

Hard Surfaced .....	27.7%
Gravel, Soil, Etc. ....	37.0%
Graded and Drained .....	21.6%
Unimproved .....	13.7%

Bus and motor freight routes serve all the principal communities within the State and connect them with points outside.

The steam railroads in Virginia operate about 4,250 miles of road, which is so distributed as to leave less than ten percent of the State's area more than ten miles from an "open" freight station. Much of this area more than ten miles from an open freight station is served by water borne transportation facilities.

The so-called "Tidewater" section of Virginia is penetrated by the estuaries of four major river systems, the Potomac, Rappahannock, York and James. In addition to these rivers which carry traffic a considerable distance inland, there are numerous minor traffic bearing creeks and channels along Chesapeake Bay.

The Potomac River has a 24 foot channel extending 108 miles from its mouth to Washington, D. C. In 1937 the River carried 2,449,622 tons of freight traffic valued at \$75,419,798.

The Rappahannock River has a 20 foot channel from its mouth to Tappahannock, a distance of 41 miles. From Tappahannock to Fredericksburg the channel depth is 10.9 feet and the distance is 66 miles. Freight traffic over this river in 1937 totaled 191,584 tons with a value of \$4,192,913.

The York River is navigable throughout its length of 41 miles with a channel depth of 34 feet for 23 miles and 23 feet for 18 miles. In 1937 it carried freight traffic in the amount of 350,389 tons valued at \$18,943,344.

The Mattaponi and Pamunkey Rivers, principal tributaries to the York, are navigable for distances of 41 and 50 miles respectively, with relatively shallow channels.

From its mouth to Hopewell, a distance of 69.2 miles, the James River has a 25 foot channel depth. From Hopewell to

the Richmond deep-water terminal, a distance of 17.8 miles, the channel depth is 25 feet and from the deep-water terminal to the Richmond Lock Gates, 3.8 miles, the channel depth is 18 feet. Freight traffic on the James River during 1937 was valued at \$90,725,568 and its tonnage was 2,242,335.

Principal navigable tributaries to the James are the Appomattox, Nansemond and Pagan Rivers with channel depths of between 10 and 12 feet. Their aggregate linear mileage is 35.6.

Waterways from Norfolk, Virginia to the sounds of North Carolina and to Beaufort Inlet, N. C., total about 56 linear miles in Virginia, with channel depths ranging from 9 to 12 feet. In 1937 these two channels carried a total of 1,043,238 tons of freight traffic valued at \$46,904,681.

Airlines operating five different routes over Virginia provide a rapid means of passenger and express transportation. Three of the lines operate both as local and through carriers in Virginia while the remaining two operate only as through lines.

### Manufactures and Finance

**T**HE total value of manufactured products in Virginia during 1937 was \$908,222,316, a gain of \$210,692,644 or more than 30 percent over the figure for 1935. Out of the 79 industries with three or more establishments listed separately by the census reports for 1937, 58 industries manufactured products valued at over one million dollars. By far the largest industry was cigarettes and tobacco, the value of which was \$298,109,316. Other important industries separately listed were: rayon and allied products, \$64,895,099; paper and pulp, \$47,440,421; clothing and hosiery, \$33,219,986; chemicals, exclusive of drugs, insecticides, etc., \$31,687,241; cotton woven goods, \$31,230,313; furniture, \$30,016,087; lumber, timber and planing mill products, \$26,960,342; fertilizers, \$20,495,097; printing and publishing, \$16,154,549; flour and other grain mill products, \$16,124,956; meat packing, \$12,839,485.

According to the State Department of Labor and Industry, the amount of capital as represented by book values of land, buildings, machinery, and plant equipment in all Virginia industries in 1938 was \$334,160,178.

The aggregate resources of 315 banks reporting to the Comptroller of the Currency June 30, 1939 totaled \$687,181,000. The capital stock including capital notes and debentures of these banks amounted to \$44,871,000 and individual deposits were \$596,115,000. The total bank transactions of four reporting clearing house exchanges in 1939 aggregated \$2,502,043,000 and internal revenue tax collections totaled \$217,188,981.

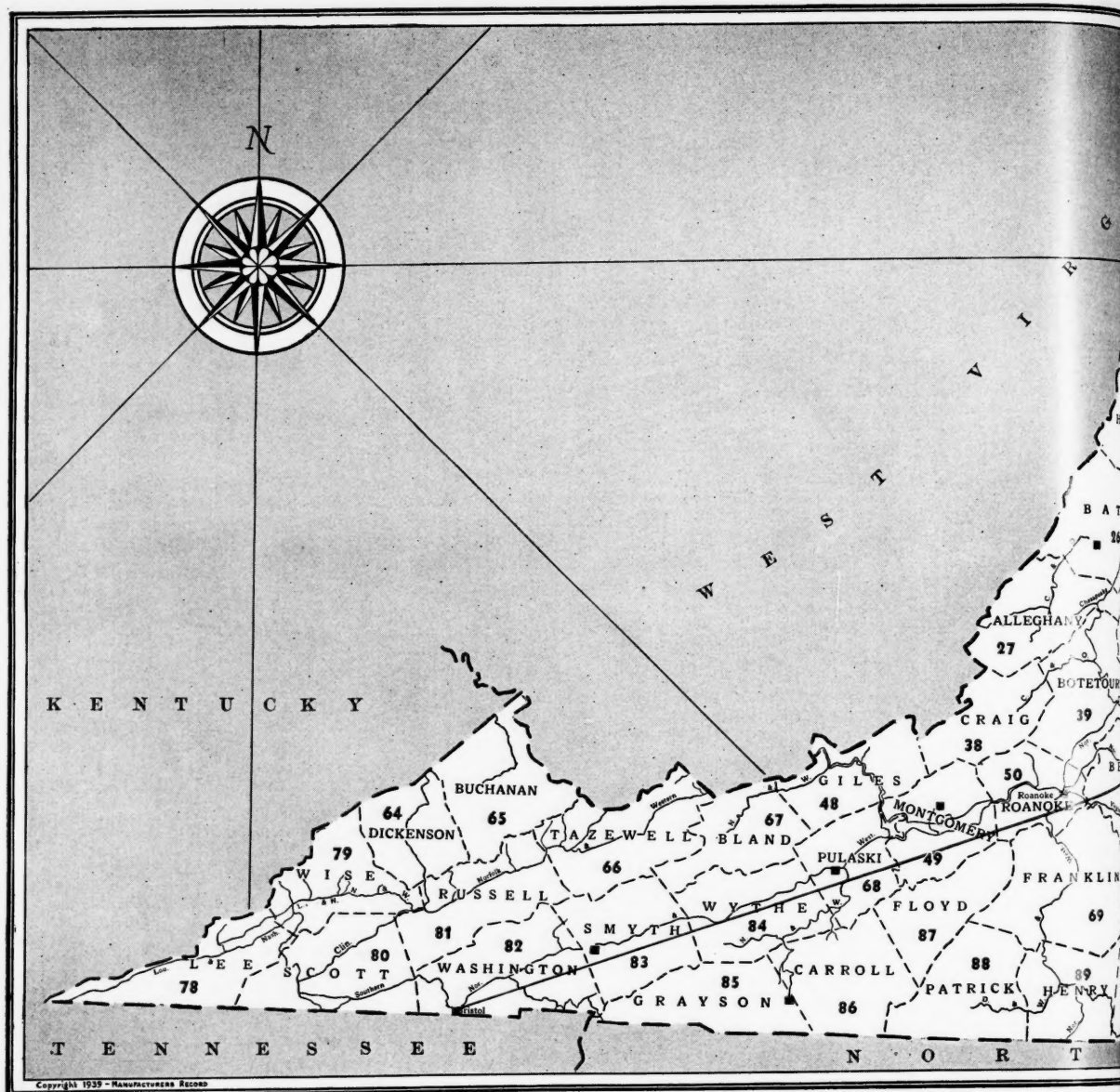
### Agriculture

**C**ASH farm income of \$121,419,000 in Virginia during 1939 was only a little more than five percent greater than the industrial payroll, but agriculture is an important factor in the economic life of the state providing a livelihood for approximately 40 percent of the population. Of this cash farm income, \$58,836,000 came from crops grown on 3,772,400 acres and \$56,295,000 was derived from livestock and livestock products. The principal crop was tobacco and the 138,232,000 pounds from 167,000 acres produced a cash income of \$17,188,000. Other important crops include: 195,050,000 pounds of peanuts yielding \$5,527,000 from 166,000 acres; 7,511,000 bushels of wheat from 518,000 acres produced a cash income of \$3,265,000; 36,530,000 bushels of corn from 1,405,000 acres yielding \$2,106,000; 12,000 bales of cotton lint produced \$544,000 plus \$74,000 from 5,000 tons of cottonseed; and 375,000 bushels of soy beans.

The value of Virginia's 2,274,000 head of livestock in 1939 was \$74,113,000. Included in this aggregate are 913,000 cattle valued at \$35,402,000 (including 428,000 cows and heifers kept for milk and worth \$20,116,000), 379,000 sheep, 717,000 swine, and 169,000 horses. The total cash farm income from dairy produce in 1939 was \$33,231,000 of which milk contributed \$15,635,000, eggs \$10,080,000, and chickens \$7,516,000. Among dairy products produced in factories in 1938, condensed milk amounted to 9,455,000 pounds, evaporated milk 14,687,000 pounds and butter 7,555,000 pounds.

(Continued on page 230)



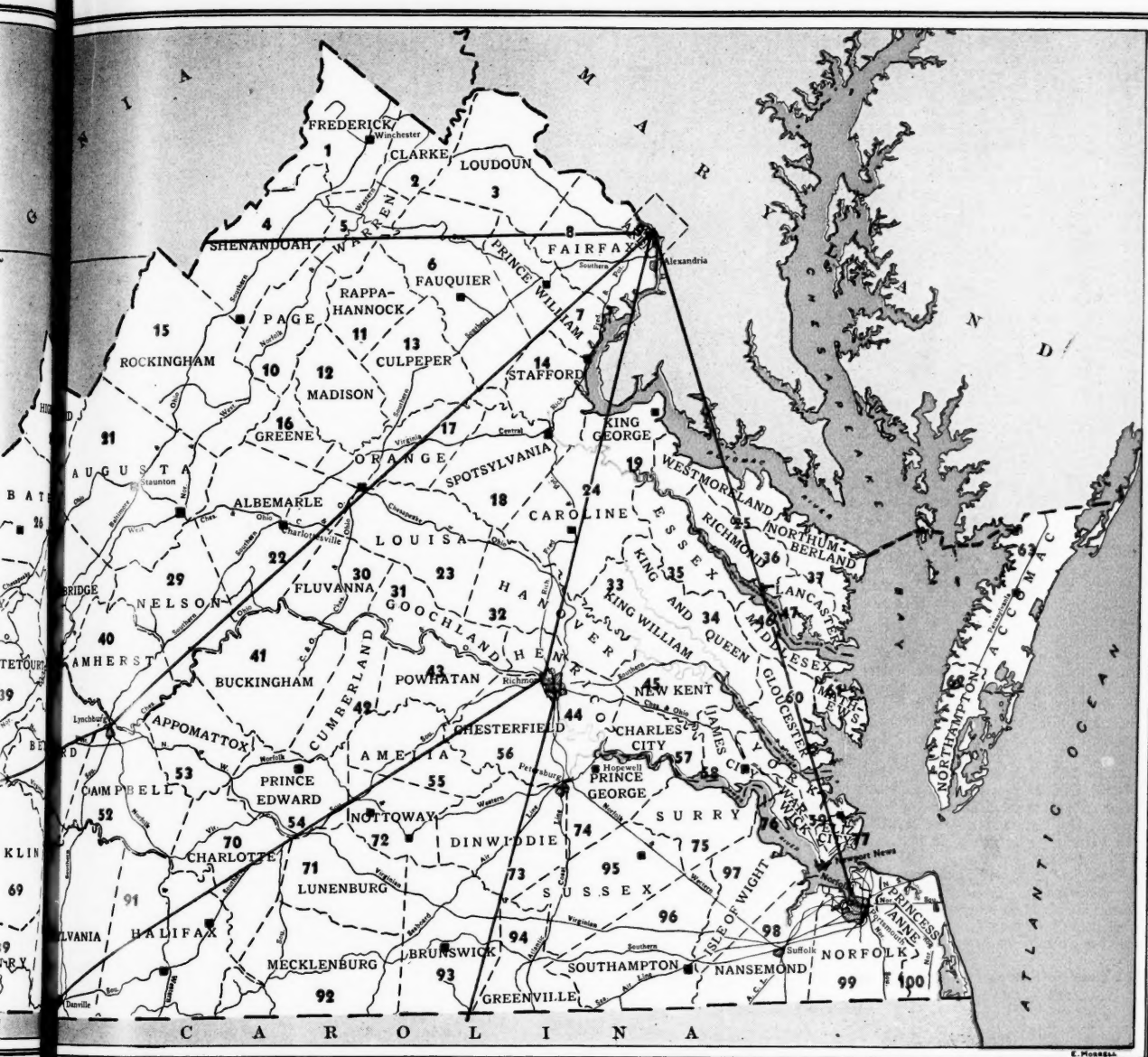


# VIRGINIA

Its principal raw materials and transportation facilities, with facts on the reverse side pertaining to its industrial growth and opportunities for industry.

MINERAL	COUNTIES IN WHICH MINERAL IS COMMERCIALY PRODUCED
Aplite— 40	
Barite— 39, 90	
Basalt— 3, 6, 8, 13, 22, 70	
Cement (natural)— 5	
Cement (Portland)— 21, 99	
Clay and shale— 1, 3, 21, 22, 28, 39, 40, 50, 51, 56, 58	
Coal— 49, 64, 65, 66, 68, 78, 79, 80, 81	
Coke— 79	
Feldspar— 40, 51, 89	
Feldspar grinding— 52	
Glass sand— 1, 28	

Gold— 8, 31, 41	
Granite— 7, 8, 10, 31, 44, 51, 52, 56, 72, 85, 88, 90, 94	
Greenstone— 52	
Gypsum— 82, 83	
Ilmenite— 29, 40	
Iron ore— 27, 39	
Kyanite— 54	
Lead— 84	
Lime— 1, 3, 4, 5, 10, 15, 21, 39, 48, 49, 53, 66, 78, 81, 83	
Limestone— 1, 3, 4, 5, 7, 10, 15, 20, 21, 26, 27, 28, 39, 48, 49, 50, 52, 66, 68, 78, 79, 80, 81, 83, 84, 85, 88	
Manganese & manganiferous ore— 4, 10, 21, 27, 28, 48, 52, 66, 67, 68, 83	
Marble— 15	
Marl (calcareous)— 21, 27, 75	
Mica— 69, 89	
Millstones— 49	
Natural gas— 30, 82	
Ochre— 68	
Phosphate— 29, 40	
Pyrite— 86	
Quartz— 51, 83	
Rutile— 29, 40	
Salt brine— 83	



**Sand & gravel**—1, 9, 15, 18, 21, 24, 44, 45, 48, 51, 56, 57, 73, 84, 99, 100

**Sandstone**—1, 6, 7, 15, 21, 64, 65, 79, 83, 87, 90, 92

**Silica sand**—1, 28

**Slate**—22, 41

**Stone (miscellaneous)**—1, 18, 20, 21, 28, 29, 38, 52, 69, 71, 79, 87, 88, 89

**Talc & soapstone**—8, 29, 69

**Titanium minerals (rutile & ilmenite)**—29, 40

**Zinc**—84

A small amount of copper and silver also is obtained as a by-product in the smelting of other ores.

#### TIMBER

**Loblolly pine**—24, 25, 31 to 37, 43 to 47, 55 to 63, 71 to 77, 92 to 100

**Mixed hardwoods**—1 to 6, 10 to 12, 15, 16, 20 to 22, 26 to 29, 38 to 40, 48 to 51, 64 to 69, 78 to 89

**Shortleaf pine & Virginia scrub pine with mixed hardwoods**—3, 6 to 9, 11 to 14, 16 to 19, 22 to 24, 29 to 32, 40 to 43, 51 to 56, 70 to 73, 90 to 93

#### AGRICULTURAL PRODUCTS

**Corn**—all counties

**Cotton**—70, 71, 72, 73, 74, 75, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100

**Peanuts**—32, 33, 45, 46, 56, 58, 62, 63, 73, 74, 75, 92, 93, 94, 95, 96, 97, 98, 99, 100

**Soy beans**—14, 15, 19, 24, 25, 32, 33, 34, 35, 37, 41, 44, 45, 46, 47, 56, 57, 58, 59, 60, 63, 69, 74, 75, 77, 78, 89, 91, 96, 97, 98, 99, 100

**Sweetpotatoes**—3, 4, 6, 7, 8, 10, 12, 13, 14, 15, 16, 17, 18, 19, 22, 23, 24, 25, 29, 30, 31, 32, 33, 34, 35, 36, 37, 39, 40, 41, 42, 43, 44, 45, 46, 47, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100

**Tobacco**—7, 12, 13, 14, 16, 17, 18, 19, 22, 23, 24, 28, 29, 30, 31, 32, 33, 34, 35, 39, 40, 41, 42, 43, 44, 49, 51, 52, 53, 54, 55, 56, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 98, 99

**Commercial fisheries**—7, 8, 14, 19, 24, 25, 33, 34, 35, 36, 37, 45, 46, 47, 57, 58, 59, 60, 61, 62, 63, 74, 75, 76, 77, 97, 98, 99, 100

— Railroads  
— Navigable Rivers  
— Airlines

■ Airports—also at principal cities printed in red

## Virginia

(Continued from page 227)

### Fisheries

**T**HE seafood industry in Virginia is one of the larger sources of occupation and revenue in the State.

In some years the seafood catch has reached a value of \$5,000,000, giving employment to 11,000 fishermen and several thousand other persons engaged in related occupations. However, increasing competition and overfishing brought serious results.

The improvement of these conditions has been actively prosecuted by the Virginia Commission of Fisheries in a program including repletion, pollution control, and marine research.

The repletion program has included planting of oyster shells, dredging of old oyster rocks, transplanting of 15,000 bushels of seed oysters, shortening of the sponge crab season, liberation of 3,000 diamond-back terrapin in Virginia waters, and the operation of a system of shad hatcheries to re-stock Tidewater rivers.

Marine research is being carried out by the commission in cooperation with several laboratories including those of the U. S. Bureau of Fisheries at Yorktown, Virginia, operated in conjunction with the State and at Solomon's Island in the Chesapeake bay, and the biology department of the College of William and Mary at Williamsburg, Virginia.

### Timber

**A**BOUT 51 percent of Virginia's total land area of 25,767,680 acres is classified as forest land. This area, comprising 13,610,000 acres, supports a commercial area of 13,375,000 acres, including 1,325,000 acres of old growth saw timber and 4,875,000 acres of second growth saw timber, or a total of 6,200,000 acres, plus 4,095,000 acres of cordwood.

The saw timber stand of 22,150,000,000 board feet consists of 10,960,000,000 board feet of softwoods (2,570,000,000 board feet of old growth and 8,390,000,000 board feet of second growth), and 11,190,000,000 board feet of hardwoods (4,090,000,000 board feet of old growth and 7,100,000,000 board feet of second growth). Southern yellow pine consisting of loblolly, shortleaf and Virginia pines measures 9,850,000,000 board feet and white pine 180,000,000 board feet, which together with 450,000,000 board feet of hemlock, 300,000,000 board feet of cypress and 180,000,000 board feet of miscellaneous southern species account for the total volume of softwood timber in the State. Hardwoods include 4,220,000,000 board feet of oaks, 1,400,000,000 board feet of yellow poplar, 1,390,000,000 board feet of red gum, 150,000,000 board feet of beech, birch and maple, 1,200,000,000 board feet of tupelo gum and 2,830,000,000 board feet of miscellaneous hardwood species.

On the cordwood areas are 6,025,000 cords of softwoods and 10,540,000 cords of hardwoods, or a total of 16,565,000 cords of all species. In addition, on the saw timber area it is estimated there are 16,110,000 cords of softwoods and 29,130,000 cords of hardwoods, or a total of 45,240,000 cords of all species, making a grand total of 62,600,000 cords on all the commercial forest land in Virginia including a relatively small cordage on areas that are restocking.

### Mining and Minerals

**V**IRGINIA, with an east-west extent of 440 miles along the southern boundary, lies athwart the "grain" of the continent. It crosses four major geologic provinces and extends into a fifth one. The formations range from very old pre-Cambrian crystalline rocks to recent sediments. In this geologic environment, the mineral resources are naturally diversified.

About 150 minerals and many rock types have been reported from Virginia. Some 40 of these materials have been mined and quarried. The State abounds in nonmetallic, or industrial, mineral resources. Metals are relatively scarce. The map (reverse side) shows the distribution by counties of the mineral resources produced in 1937-8, the last years for which the statistical canvass has been completed. Others may be developed as new uses are found and as better and more economical processes of recovery and refining are developed.

The annual value of mineral production since the World War has ranged from more than \$85,000,000 in 1920 to \$17,000,000 during the 1932 part of the depression. The 1938 value may exceed \$50,000,000.

Coal is the most valuable resource, accounting annually for about half of the value of production. Coal of anthracitic rank is mined along New River. The Triassic coals of the Richmond basin were mined in 1937-8. The total reserves in the State are estimated to be more than 20 billion tons.

Limestone in all grades, from dolomite to almost chemically pure limestone, is "inexhaustible" in most of the counties west of the Blue Ridge. Much of it is readily accessible and now is both an important source of mineral wealth and of industrial opportunity.

Black marble is quarried in Rockingham County. It is much used for interior work. Greenstone is obtained at Lynchburg. Soapstone occurs in large bodies in Albermarle and Nelson counties. The slate of Buckingham County is well known. Sandstone in Frederick County produces a fine grade of glass sand. Granite and similar rocks are extensively quarried throughout the Piedmont region.

Feldspar is one of the most important industrial minerals. A rock called "aplite" is being developed in Nelson County. An important deposit of kyanite is found in Prince Edward County. Diatomite underlies a long belt in the western Coastal Plain counties and the salt and gypsum deposits in Smyth and Washington counties have long been worked.

The important metallic deposits include zinc, pyrrhotite, titanium ores, and iron. A large modern mill in Nelson County obtains ilmenite, also apatite, from the rock "nelsonite." Another large modern mill obtains rutile and ilmenite from "pegmatite." Iron is unimportant at present. A large zinc mine is located in Wythe County. The large pyrrhotite "lead" in Grayson and Carroll counties is actively developed.

### Electric Power

**P**RODUCTION of electric power in Virginia by public and private utility plants during 1939 totaled 1,875,120,000 kilowatt hours. Of this, 1,514,845,000 kilowatt hours were generated by fuel operated plants and 360,275 kilowatt hours originated in hydroelectric plants.

At the end of 1939, 75 plants in the state had a combined generating capacity of 573,141 kilowatts. Making up this total were 20 steam power plants with a generating capacity of 380,960 kilowatts and 38 water power plants capable of generating 181,649 kilowatts. Seventeen internal combustion engine plants were capable of developing 10,532 kilowatts.

### Taxation

**R**EAL estate is taxed locally and rates are fixed annually. Assessed values of real estate vary but the average is about 40% of fair market value. Machinery and tools are taxed locally at local rates.

Inventory of stock on hand in Virginia, materials for use in business, excess of bills and accounts receivable over bills and accounts payable, money on hand and on deposits, and all other taxable personal property, except shares of stock in corporations, bonds of the political subdivisions of the State, and machinery and tools are taxed by the State as CAPITAL at the rate of 75c on every \$100 of the actual value of such capital.

Incomes of manufacturing corporations in Virginia are subject to a State tax of 3% on net incomes derived from their Virginia business. When a corporation pays the State a tax on all its net income, the dividends are not further taxed in the hands of the stockholders. If the corporation is subject to State taxation on a part of its income only, a corresponding percentage of the dividends is exempt in the hands of resident stockholders. Non-residents of Virginia are not subject to the Virginia income tax on dividends.

Domestic corporations are required to pay annually a franchise tax of \$10 on capital stock up to \$25,000 and \$200 on capital stock between \$500,001 and \$1,000,000. Between one and fifty million dollars an additional \$10 per hundred thousand. Other rates apply on corporations with capital stock in excess of \$50,000,000. Foreign corporations are not subject to the franchise tax but both foreign and domestic corporations are required to pay annually a nominal registration fee.

There is no state tax on real estate and machinery and tools. The assessed value of all taxable property in 1939 was \$2,164,664,264.

### Labor and Wages

**W**ITH a density of 60.2 per square mile, the population of Virginia is fairly evenly distributed and only three cities, according to preliminary announcements of the 1940 census, had a population in excess of 50,000—Richmond, 190,341, Norfolk, 143,275, and Portsmouth, 50,687. Roanoke in 1930 had a population of approximately 69,000. The urban population comprises only 32.4 percent of the total. Over 95 percent of Virginia's white population is of native American parentage and only 1.3 percent are foreign born. Foreign stock accounted for 3 percent.

Due to the great diversity of employment conditions in manufacturing together with the number of industries and the variety of locations, it is virtually impossible to arrive at any useful conclusion regarding average wage rates. However, in view of the fact that all but one county supports some industries and the proximity of a large population in Washington, D. C., there is usually an abundance of labor for all purposes. Virginia labor has been aptly described as typically southern in that it is loyal, willing and intelligent.

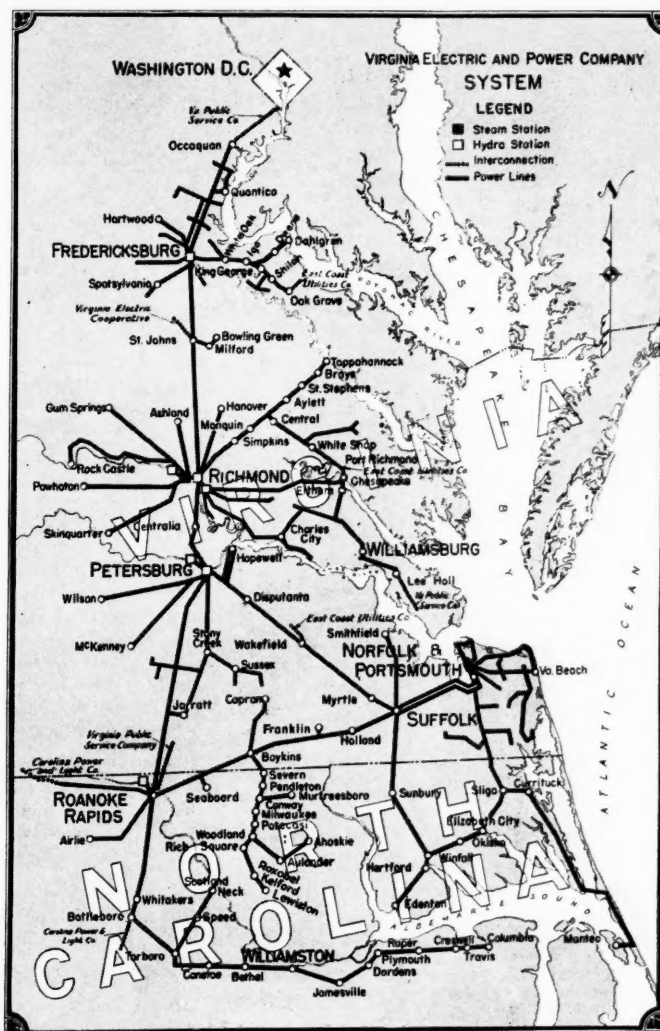
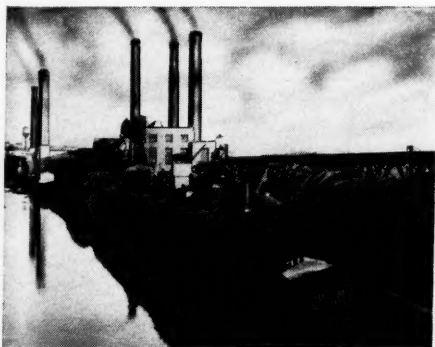


# AN INVITATION TO INDUSTRY

**T**HE Virginia Electric and Power Company has just completed another large addition to its steam power station in Richmond, Va.—the second such addition in the last three years.

This station is one of the major steam stations of the Vepeco Electric System serving Tidewater Virginia and North Carolina where favorable climatic conditions and economic factors are attracting the locations of many new industries, and the relocation of others.

New industries, or industries already established but seeking more favorable locations for their plants, are invited to make a study of this area of Tidewater Virginia and North Carolina and the many advantages it has to offer. Inquiries addressed to us will have prompt attention.



The Electric Transmission System of the Virginia Electric and Power Company, comprising 2 large steam stations, 7 hydro stations, and 5 interconnections with neighboring utility companies, serves approximately 160,000 customers in nearly 500 cities, towns, and communities with an ample supply of dependable electric power.

A view of the 12th Street Station of the Virginia Electric and Power Company in Richmond, Va., showing the new addition which has just recently been completed.

## VIRGINIA ELECTRIC AND POWER COMPANY

FREDERICKSBURG • RICHMOND • PETERSBURG • NORFOLK • PORTSMOUTH • SUFFOLK •  
WILLIAMSBURG, (Virginia) • ROANOKE RAPIDS and WILLIAMSTON (North Carolina)



# West Virginia

## The Resource-Full State

From the time its products went to market on flatboats until now when it is a major contributor to many of today's manufacturing miracles, WEST VIRGINIA has been generous in the natural resources and geographic advantages it places at Industry's disposal. Superior Coal, sufficient for ages to come, Natural Gas, Petroleum, Silica Sand, Salt Brines and many other materials so important to modern Industry, are abundant and easily accessible.

WEST VIRGINIA'S geographical location, too, is fortunate. Within a few hours from its borders are the Nation's largest markets, more than half its population, reached quickly by all forms of transportation.

WEST VIRGINIA'S Labor is 90 per cent. native born. Its Electric power is ample; and to the stability of this favored manufacturing region can be added the co-operative attitude of public and private organizations.

Upon these basic elements WEST VIRGINIA has steadily climbed in production, in variety of products and in importance. WEST VIRGINIA'S opportunities for industries seeking new manufacturing sites seem limited only by man's ingenuity in fulfilling mankind's ever growing material needs. Specific details may be obtained by writing: *Industrial Development Committee, West Virginia Publicity Commission, Capitol Building, Charleston, W. Va.*



LOOK TO WEST VIRGINIA FIRST!

# WEST VIRGINIA



(Photo by Bollinger)

Chemicals, based in large part upon the state's vast mineral resources, comprise West Virginia's largest industry. The plant pictured here is that of the Carbide and Carbon Chemicals Corp. at Charleston.

## WEST VIRGINIA — ITS ECONOMIC DEVELOPMENT

WEST Virginia is a land of many natural resources. Its timber, coal, oil, gas, clay, limestone and sandstone which are found so abundantly and in such great variety are well known to the outside world. There are other minerals such as brines, bitumen, manganese and building stone which are not so well known because they have not been exploited so extensively. Its fruit, farm and grazing lands, blessed with abundant rainfall and bathed in a healthful climate, provide a good place within which to live. Its great scenic beauty is a lure to tourists.

Topographically, the State is not a natural political unit. Its streams flow out in all di-

rections, thus dividing the land into many valleys which are often separated by mountain ranges. Avenues of communication and commerce naturally follow more or less the streams and valleys, so that the State is widely divided in its economic relations, not only within itself but with other states. The northern part has interests in common with Ohio

and Pennsylvania. Pittsburgh is the metropolitan center. The eastern part is tributary to the Atlantic coast where Washington and Baltimore are trading centers. The western part finds its outlet to markets through the Ohio Valley and centers its trade relations in Cincinnati; while the southern tier of counties has much in common with Virginia. There is no large city of metropolitan aspect within the State. These facts are strikingly illustrated in the varied newspaper circulations.

Such conditions have had a profound effect upon the State's economic development. Capital has of necessity come from without

BY  
Dr. William S. Downs  
*University of West Virginia,  
Morgantown, W. Va.*





the State and from many directions. To capital is attached leadership and management which very often have remained outside the State. Resources were developed primarily to support industries located in other States. Nevertheless, many local enterprises have existed within the State; some of them dating almost from the time of the first settlement. The history of these local developments often reveals interesting examples of pioneering enterprise.

#### Early Industries

Long before railroads appeared and when transportation depended primarily upon the rivers the iron industry was a thriving enterprise in many parts of the State. Blast furnaces existed in which was smelted a low grade of iron ore found principally in the upper coal measures. Limestone which was found near the ore deposits was employed for fluxing and charcoal made in the virgin forests was used for fuel. Great ingenuity was shown in overcoming obstacles. Miles of tramways were constructed entirely of wood, the rails being mortised into the ties. Local cements were discovered and refractory products were manufactured to equip furnaces. Water power was harnessed to propel many kinds of crudely devised machinery. A good quality of iron and steel was produced.

*West Virginia long has been known as a petroleum producing state and the refineries, like this one of the Elk Refining Company at Falling Rock near Charleston, provide employment for hundreds of people and have an output valued annually in excess of \$11,000,000.*

The growing demand arising from the rapid settlement of the Ohio and Mississippi valleys and the availability of easy water transportation down the rivers caused these enterprises to expand into varied manufacturing industries. Foundries and forges were established for converting the iron into agricultural and household implements. Stove factories were added and nails or spikes in great quantity were manufactured by hand labor. It is said that in the War of 1812

*This view of the Libbey-Owens-Ford Glass Company plant at Charleston emphasizes the fact that glass manufacturing is essentially a chemical industry which in this instance is using southern raw materials and producing finished products that are finding a ready market in the South. In this plant is made not only glass and glass products but many unique products of a glass character that are being used for structural building purposes.*



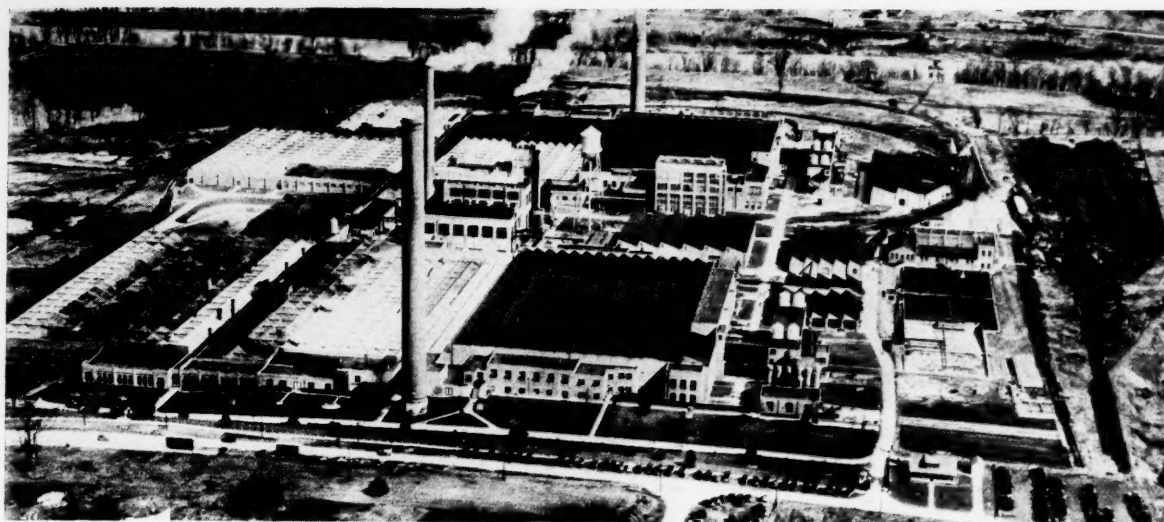
Captain Perry used iron from western Virginia to make cannon balls and to equip his ships for the battle of Lake Erie.

The building of railroads, however, wrought changes in transportation conditions. They made available better and cheaper iron ore, found in the Lake Superior region. This ore could be shipped by water and rail to the sources of fuel; and the early development of coal fields near Pittsburgh made that city an economical center for the iron industry. In West Virginia, however, Wheeling retained some of the early iron industry as now represented by plants of the Wheeling Steel Corporation, and the Weirton Steel Company.

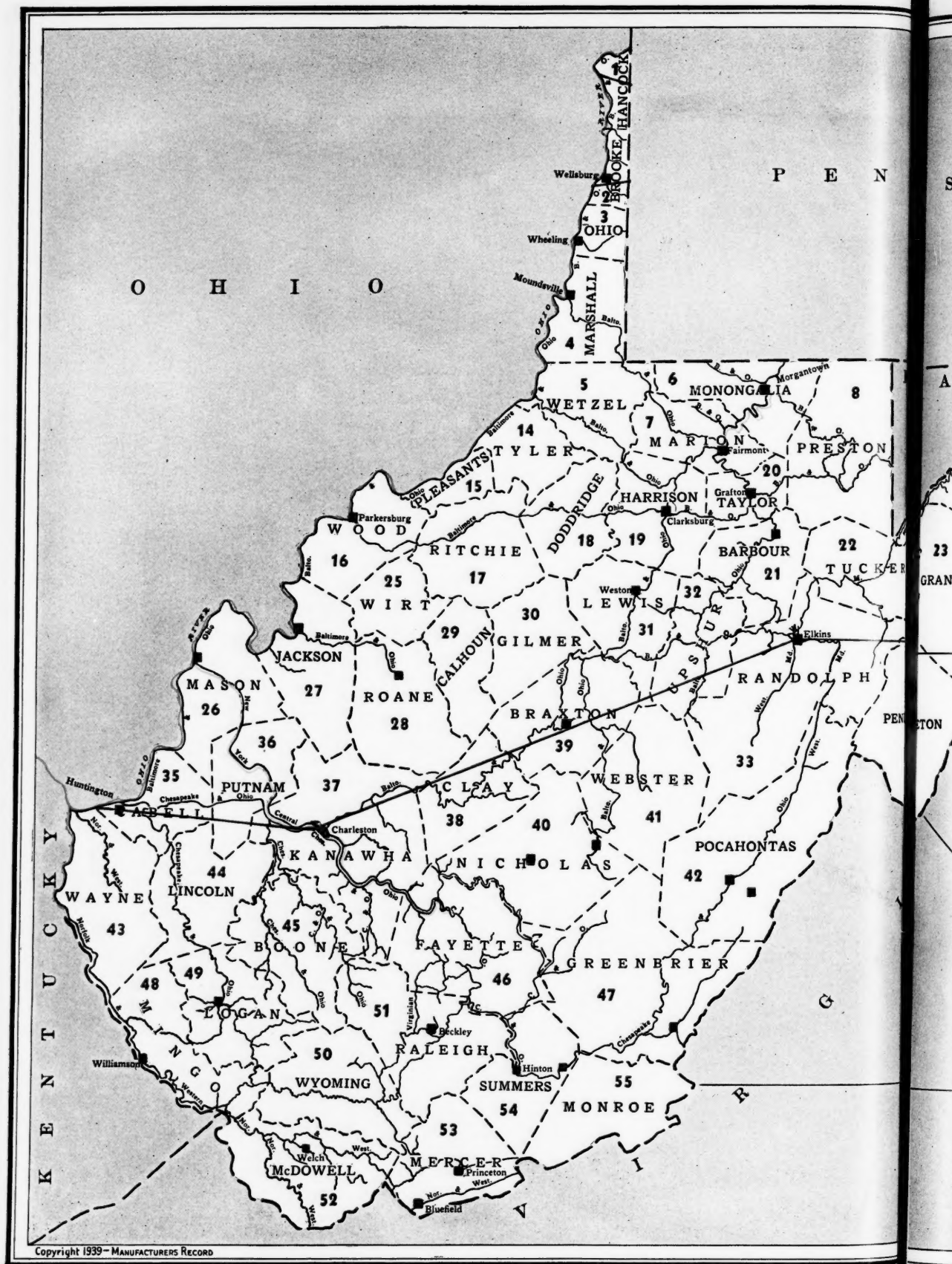
In the early pioneer days it was recognized that the Pottsville Conglomerate or the Millstone Grit, a sandstone found in the mountains of West Virginia, was the best source from which millstones could be made. Quarries were established and the manufacture of millstones became an important industry, particularly in what is now northern West Virginia. Situated near the headwaters of navigation and surrounded by vast forests these quarries supplied the early inhabitants of the Mississippi Valley and its tributaries with millstones for the many local grist mills which were then needed. The millstones were loaded on rafts or boats fashioned from the native timber and with pottery manufactured from the clays and iron taken from the hills, the cargoes were floated down the river to market. The grist mill has disappeared and "burr stones" are no longer needed, but other sandstones are still quarried in West Virginia to supply pulp mills in Canada with millstones which are used to grind pulp.

Another commodity sorely needed by early settlers was salt. It was a costly task to transport salt on the backs of animals from the eastern seaboard over the Allegheny mountains. The natural salt springs in West Virginia and later the salt wells which tapped the salt brines found extensively in the Kanawha Valley, offered the means of supplying the western settlers with this indispensable commodity. Natural gas had been discovered by the first settlers in West Virginia in places like "Burning Springs,"—a phenomenon which attracted the attention of George Washington during his visit to the Kanawha Valley. Later in drilling for salt brine, gas was

(Continued on page 240)



*Industrially, West Virginia is famous as a coal and chemical producing state, many of the chemicals themselves being derived from coal. Here are three large plants representative of these industries. Top—One of the American Viscose Corporation's West Virginia plants, at Parkersburg, where huge quantities of rayon are produced. Center—The Federal Number One Mine of the Koppers Coal Company at Grant Town. Bottom—At the Charleston plant of the Owens-Illinois Glass Company is manufactured much of the glass and glass products in an industry whose value in West Virginia annually exceeds \$50,000,000.*





# West Virginia

Its principal raw materials and transportation facilities, with facts on the reverse side pertaining to its industrial growth and opportunities for industry.

## MINERAL COUNTIES IN WHICH MINERAL IS COMMERCIALY PRODUCED

**Bromine**— 26, 37  
**Calcium chloride**— 26, 37  
**Cement (Portland)**— 8, 12, 43  
**Clay**— 1, 7, 12, 16, 19, 20, 31, 32, 35, 37, 53  
**Coal**— 1, 2, 3, 4, 6, 7, 8, 9, 19, 20, 21, 22, 23, 26, 30, 31, 32, 33, 36, 37, 38, 39, 40, 41, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53  
**Coke**— 1, 2, 4, 7, 8, 37, 46  
**Crushed stone**— all counties  
**Dolomite**— 12  
**Glass sand**— 11  
**Lime**— 6, 8, 12, 42, 47, 53, 55  
**Limestone**— 6, 8, 10, 11, 12, 13, 19, 22, 23, 24, 33, 34, 47, 53, 54  
**Magnesium chloride**— 26, 37  
**Manganese**— 47, 55  
**Marl**— 12, 23, 47  
**Natural gas**— 4, 5, 6, 7, 14, 15, 17, 18, 19, 20, 21, 25, 26, 27, 28, 29, 30, 31, 32, 35, 36, 37, 38, 39, 40, 43, 44, 45, 46, 48, 49, 50, 51  
**Petroleum**— 1, 2, 4, 5, 6, 7, 14, 15, 16, 17, 18, 19, 25, 27, 28, 29, 30, 31, 35, 37, 38, 39, 43, 44, 45  
**Pulpstone**— 6, 15, 45  
**Salt brine**— 26, 37  
**Sand and gravel**— 2, 3, 4, 5, 10, 16  
**Sandstone**— all counties

## TIMBER

**Oak**— all counties  
**Beech-birch-maple**— all counties  
**Red Spruce**— 7, 8, 19, 20, 21, 22, 23, 24, 29, 30, 31, 32, 33, 34, 40, 41, 42, 45, 46, 47, 49, 50, 51, 52, 53, 54, 55

## AGRICULTURAL PRODUCTS

**Corn**— all counties  
**Tobacco**— 26, 35, 36, 43, 44  
**Soy beans**— small quantity in almost every county  
**Sweetpotatoes**— 16, 17, 26, 27, 28, 29, 30, 32, 35, 36, 37, 38, 39, 40, 43, 44, 45, 46, 48, 49, 50, 51, 52, 54, 55

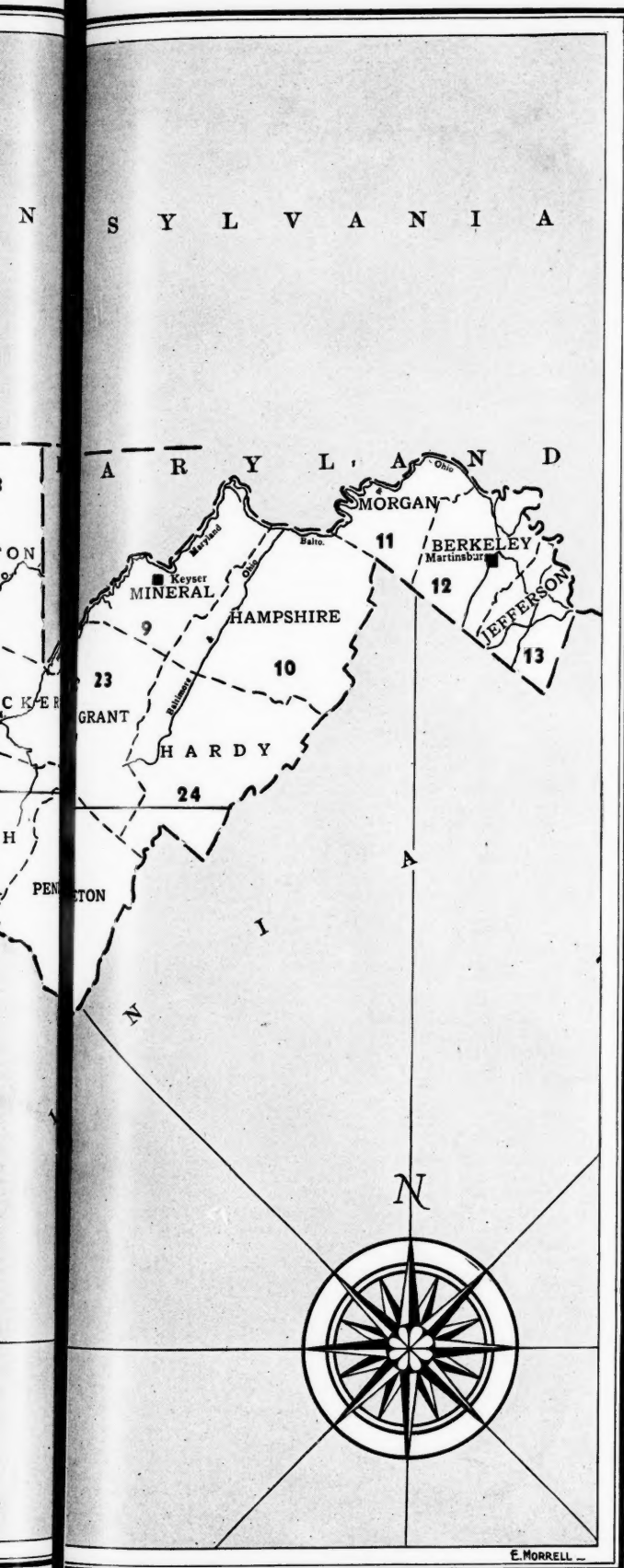
Natural gas is available for consumption in the following counties: 1, 2, 3, 4, 5, 6, 7, 8, 9, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25, 26, 27, 28, 29, 30, 31, 32, 33, 35, 36, 37, 38, 39, 40, 43, 44, 45, 46, 47, 48, 49, 50, 51, 53

— Railroads

— Navigable Rivers

— Airlines

■ Airports—also at principal cities printed in red



# West Virginia—

## With its Mineral Wealth Offers Diversified Opportunities for Industry

**W**EST VIRGINIA, which formed a part of Virginia and was included in the original Colony of Virginia, broke away from Virginia when the latter seceded in 1861. Starting with a convention of delegates from twenty-six counties at Wheeling in June 1861, a constitution was drafted the same year and ratified in April 1862. On June 20, 1863, West Virginia was admitted to statehood in the Union.

Which white people were the first to set foot on West Virginia soil is not known but presumably it was some of the early settlers crossing into Ohio early in the eighteenth century. The first structure is believed to have been the log cabin of Morgan Morgan erected in 1727 in what is now Berkeley County. Thereafter the settlement of the area got under way but it was a slow process for the mountains were a serious barrier.

Originally settled in large part by pioneers from Maryland and Pennsylvania, West Virginia's population, estimated at 1,849,000 in 1937, is predominantly American with over 96 per cent of native origin.

West Virginia ranks 27th in population and 40th in size with 24,170 square miles.

### Climate

**A**LTHOUGH the physical conditions of West Virginia cause the climate to be varied, it is nevertheless genial and conducive to good health. The temperature, which averages 53.2° Fah., is moderate even in winter and uncomfortable hot spells are virtually unknown. The rainfall is ample and well distributed with an average of 45.05 inches. This latter however has a fairly wide range of 38 to 60 inches, the heaviest occurring in June-July and the smallest in November.

### Transportation

**W**EST VIRGINIA, which is within 350 miles of nearly half the nation's population, is well supplied with transportation facilities. The railroads, operating a total of more than 4,000 miles, occupy an important position because of the state's preponderance of heavy commodities. Nine class I railway companies provide an extensive and adequate service for passengers and freight.

The total West Virginia road mileage totals almost 33,000 miles. Of this amount, over 4,760 miles are primary roads and include 1,610 miles of hard surface; 2,222 miles of bituminous surface, 520 miles of stone or gravel, 165 miles of graded and drained, and 243 miles are unimproved. The 28,210 miles of secondary roads comprise 323 miles of hard surface, 1,315 miles of bituminous surface, 4,773 miles of stone or gravel, 1,257 miles of soil surfaced, 5,607 miles of graded roads, and the balance are unimproved. Operating on this network of highways are more than 600 busses and over 45,000 motor and tractor trucks to supply the people and industries of West Virginia with ample freight and passenger transport.

Augmenting the railroads and highways are numerous navigable waterways including the Ohio river which traverses a major part of the state's western boundary. Finally, West Virginia also is served by commercial air lines.

### Manufactures and Finance

**T**HE value of West Virginia's manufactured products in 1937 was \$480,526,030, an increase of \$113,951,963 or almost 31 per cent over the 1935 amount.

Outstanding among the state's industries is that of chemicals with products in 1937 valued at \$58,267,326. A close second was glass manufacturing with products valued at \$52,954,985. Other important industries separately listed in the census reports with their respective value of products include: clay and pottery products including porcelain, \$17,378,509; sheet, structural and ornamental metalwork, foundry, stamped and pressed metal products, \$16,677,277; electric and other machinery including machine shop products, \$15,852,412; lumber, timber and planing mill products, \$13,706,209; petroleum refining, \$11,607,878; coke oven products, \$11,101,503; tanned, curried and finished leather, \$9,683,163. Altogether the census report lists 52 separate industries of three or more establishments and of these 33 have an annual production value exceeding one million dollars. However, in addition there are 115 other plants whose combined products were valued at \$199,852,482 in 1937.

The cost of materials, fuel, electric energy and containers used in manufacturing was \$257,751,612 and the 83,464 wage earners employed in 1,057 establishments had a combined payroll totaling \$102,511,473.

The aggregate resources of the 181 West Virginia banks reporting to the Comptroller of the Currency on June 30, 1939, amounted to \$341,803,000 of which individual deposits comprised \$289,667,000. Capital stock of these banks including capital notes and debentures was \$26,649,000. Bank transactions as represented by three reporting clearing house exchanges totaled \$269,260,000 in 1939 while internal revenue collections in the same period amounted to \$20,492,311 of which \$9,416,176 were corporation income tax receipts.

### Agriculture

**A**LTHOUGH nearly 72 per cent of West Virginia's population is classified as rural, the farm population comprises only 26 per cent. Furthermore, of the state's entire area the aggregate crop acreage in 1939 was only slightly over 10 per cent and amounted to 1,498,000 acres. From this farm crop acreage was derived a net cash income of \$11,028,000 which together with \$29,682,000 from livestock and livestock products formed the major part of the state's net cash farm income totaling \$42,510,000.

The total number of livestock in West Virginia in 1939 was

1,468,000 valued at \$37,944,000 of which the largest part was 600,000 cattle valued at \$22,116,000 including 251,000 cows and heifers kept for milk and valued at \$11,546,000. Sheep numbering 531,000 with a value of \$2,898,000, 230,000 swine worth \$1,539,000, 95,000 horses valued at \$10,119,000, and 12,000 mules valued at \$1,272,000 make up the balance of livestock. Cash farm income from dairy produce in 1939 totaled \$15,412,000 including \$9,433,000 from milk and \$4,737,000 from eggs.

Among the more important crops of 1939 with their respective quantities were: corn, 13,994,000 bushels; wheat, 2,102,000 bushels; oats, 1,460,000 bushels; tobacco, 2,175,000 pounds; and apples, 7,376,000 bushels.

## Timber

OF West Virginia's 8,960,000 acres of forest land, which is considerably more than half the state's entire area, 8,860,000 acres are described as commercial forest.

The major part of the state's forest land is the cordwood area amounting to 3,985,000 acres containing 1,020,000 cords of softwood and 13,100,000 cords of hardwood or a total 14,120,000 cords. However, from the point of view of quantity, the largest cordwood volume is on saw timber areas and comprises 1,600,000 cords of softwood and 19,900,000 cords of hardwood—21,500,000 cords, or a grand total of 35,625,000 cords exclusive of a small quantity on restocking areas.

The forest supports a total stand of 8,850,000,000 board feet. The old growth saw timber area of 665,000 acres supports a stand of 3,180,000,000 board feet of which 2,580,000,000 board feet are hardwoods and 600,000,000 board feet are softwoods. The second growth board foot volume, which occurs principally on the second growth saw timber area of 1,995,000 acres, consists of 5,160,000,000 board feet of hardwoods and 500,000,000 board feet of softwoods, a total of 5,670,000,000 board feet.

Wage earners engaged in West Virginia's 141 lumber industry establishments numbered 5,538 in 1937 and produced products valued at \$11,829,085. Included among these products were 294,272,000 board feet hardwood lumber and 58,325,000 board feet softwood or a total lumber sawed of 352,597,000 board feet.

## Mining and Minerals

THE annual value of West Virginia's mineral production is exceeded by only three other states, but in relation to the state's general economy it is the most important factor. Coal, which is the principal mineral, consists of several seams, one of them alone constituting the most valuable single mineral deposit known anywhere in the world. Every kind of bituminous coal is found in West Virginia and its production exceeds that of any other state. Yet coal reserves of a commercial character have been conservatively estimated at far more than one hundred billion tons. As a source of employment, coal with over 100,000 wage earners has no competitor and far outranks the 83,464 wage earners of all manufacturing in West Virginia. With a total mineable area equal to approximately 37,524 square miles underlying 17,280 square miles of the state, West Virginia's coal and coal by-products together with other minerals offer unusual opportunities for industrial development.

On the accompanying map is shown those minerals now being commercially produced. In addition, there are other deposits of these and other minerals in West Virginia which may possibly in some instances offer commercial possibilities. Numerous deposits of limonite and hematite are known and several have been mined in the immediate past. Bromine has been manufactured from brine in two different counties to date. Clay for brick and stoneware as well as fire clay is available extensively in numerous counties. Dolomite, grahamite, grindstone, pulpstone, salt, siderite and slate all occur in quantity and have been mined in a greater or lesser degree at one time or another. Limestone for building, as crushed stone, as a flux, and for agricultural purposes is found in large quantities throughout the state. Salt brine is the basis of an important industry.

Sand for building and molding is available in numerous localities but the sand of most importance is glass sand. Large quantities of an excellent quality of this sand occur in many counties.

West Virginia sandstone suitable for every purpose can be found throughout the state.

Petroleum has been produced over a long period in large quantities, but in recent years production has been steadily declining. However, there is possibility that new methods and deeper wells will increase production; meanwhile the extensive oil shales offer potentialities against the time of oil exhaustion.

Though natural gas is usually associated with petroleum, in

many counties of West Virginia it is found alone. At present the state ranks high in production and the future appears even more optimistic particularly in the Oriskany sands while other opportunities for development are regarded as distinctly possible in deeper sands. The average heating value of natural gas in West Virginia is about 1,138 B. T. U.

Mineral springs form the nuclei of several important recreational and health restoring resorts.

## Electric Power

PRODUCTION of electricity by private and public plants in West Virginia during 1939 amounted to 3,219,603,000 kilowatt hours, an increase of 723,827,000 kilowatt hours over the 1938 amount. Of this sum, 2,841,854,000 kilowatt hours were produced by fuel operated plants and 377,749,000 kilowatt hours originated in hydro electric plants.

The total generating capacity of the state's 42 plants was 733,348 kilowatts at the close of 1939. Making up this total were 19 steam plants capable of developing 627,000 kilowatts, 12 water power plants with a generating capacity of 100,980 kilowatts, and 11 internal combustion engine plants having a capacity of 4,768 kilowatts.

## Taxation

DOMESTIC corporations of West Virginia are required to pay annually a franchise tax based upon authorized capital stock starting from \$20 on \$5,000 or less with \$10 increases up to \$100 on \$100,000. Exceeding that sum there are additional increases up to \$150 on \$200,000. Beyond \$200,000 and not more than \$1,000,000 the tax is \$180 plus 20 cents on each \$1,000 in excess of \$200,000; in excess of \$1,000,000 and not more than \$15,000,000 the tax is \$340 plus 15 cents on each \$1,000 in excess of \$1,000,000. For corporations with stock greater than \$15,000,000 there is a flat tax of \$2,500. Shares of stock having no par value are presumed for the purposes of assessment to be at \$25 unless it was originally issued for a greater consideration. Foreign corporations are taxed on the same basis plus 50 per cent of the tax with an annual minimum of \$150.

There is no state corporation income tax but there is a gross sales tax of \$1.30 on each \$100 of coal; \$3.90 on blast furnace slag, sand, gravel or other mineral products not mined or quarried; \$7.80 on natural gas with an exemption of tax on the first \$5,000 gross receipts; \$1.95 on limestone or sandstone and timber; other natural resource products, \$2.60; and manufactured products \$0.39. An exemption is granted in every case of \$25 in the amount of tax computed under any of the provisions of the act.

County and local tax rates on money, notes, bonds, bills and accounts receivable, stocks and other similar intangible personal property range from 28.25 cents to 95.25 cents per \$100. All other property falling within the purview of local taxation is taxed at rates of three and four times that of intangible property.

The assessed value of all taxable property in 1939 was \$1,817,044,173.

## Labor and Wages

ALTHOUGH West Virginia had ten cities in 1930 exceeding ten thousand population each, including Charleston which in 1940 has a population of 67,282, Huntington 78,781 and Wheeling 61,007, and the population density is 72 per square mile, the urban population comprises 28.4 percent. Only one of the state's 55 counties supports no manufacturing establishments.

Of the white population comprising 93.3 per cent of the whole, 90.6 per cent are of native parentage; those of foreign parentage are only 4.1 per cent and the foreign born only 3.2 per cent.

A plentiful supply of loyal, intelligent and willing labor is available in all industries to supply a reasonable demand. As of recent date, the annual average wage rates covering all classes of labor for the several basic industries together with the average number of days operated is as follows: building and construction, \$1,237.50 and 284 days; chemical and allied products \$1,528.77 and 307 days; clay, stone, etc., \$1,243.35 and 255 days; coal, \$1,285 and 188 days; food products, \$1,265.22 and 311 days; glass, \$1,354.34 and 253 days; iron and steel, \$1,443.63 and 282 days; lumber and allied products, \$984.07 and 274 days; petroleum, \$1,577.19 and 323 days; public utilities, \$1,406.53 and 352 days.





## West Virginia

(Continued from page 234)

encountered. Soon the natural gas was used to evaporate the brine in the manufacture of salt. Sometimes, in drilling for salt the "Devil's grease" would penetrate into the well, and thus ruin the brine for salt making purposes. It was the first indication of the vast deposits of petroleum which later were to be developed in West Virginia. Instead of the "Devil's grease" ruining the salt well, it soon became the fear of drillers that salt water might drown out the oil well. The necessity of drilling comparatively deep holes to reach the West Virginia salt brines caused the early invention of drilling practices upon which the petroleum industry of the world was founded.

Although the salt industry in the Kanawha Valley finally yielded to outside competition, the great store house of natural gas, salt brine and coal form the basis upon which has been built the great chemical industries for which the Kanawha Valley is now famous.

A mineral of vast chemical possibilities is limestone which is found in great quantity and of wide variety in the eastern tier of counties. More than one hundred years ago this limestone was burned in kilns for the manufacture of commercial lime. With a calcium content of almost 100 per cent, it found a wide market. Also from the dolomites there were obtained a natural hydraulic cement which was manufactured in Jefferson County more than a century ago. The Bessemer process for making steel created a new demand for West Virginia limestones and millions of tons have been quarried or mined and shipped to Pittsburgh and other steel centers. These limestones also were used for railroad ballast and for building roads.

Long before the automobile appeared, the eastern panhandle of West Virginia boasted of a system of all-weather improved highways. In the present era of highway improve-

*The Ames Baldwin Wyoming Company plant at Parkersburg is the world's largest producer of shovels. Both steel and hickory, necessary for the manufacture of shovels, are produced in West Virginia, the latter being the largest producer of hickory among all the states.*

ment the limestones have found many new and almost indispensable uses; but in recent years use has expanded for other purposes. Portland cement mills are in operation in several parts of the state and at Millville, in Jefferson County, rock wool, refractory materials and magnesium products are manufactured. The possibilities offered by the electric furnace with limestone, coal, silica and other minerals stirs the imagination.

Not all the pioneering in industry was confined to minerals. The first settlers in West Virginia brought with them apples, pears, peaches and other fruit. In the rich hills and valleys the trees thrived and the fruit developed a remarkably delicious flavor with seldom a crop failure. New varieties such as the "Grimes Golden" and "Golden Delicious" sprang from seedlings. Each farmer considered the orchard a necessary part of his farm but for more than a hundred years apples were raised for local consumption only. The famous "Appie Pie Ridge" in Berkeley County, so-called from time immemorial, where people came from far and near to obtain tree cuttings, was the home of John Miller, who is credited with establishing the first commercial orchard in the East. The Shenandoah Valley in West Virginia is now famous for its fine apples which are shipped to all parts of the world.

### Economic Changes

The history of the State's industrial development shows that improvements in transportation facilities, such as the railroads, were an important factor in the development of the great natural resources; but it shows also that changes in transportation brought changes in

the trend of industrial development within the State. Instead of utilizing the natural resources in manufacturing enterprises within the State the raw products have been transported out of the State to previously established manufacturing centers where they have stimulated employment and created wealth in other communities without leaving a commensurate share of prosperity within the state that furnished the resources. This is especially true in the case of natural gas, oil, timber and coal. West Virginia now leads all the States in the Union in the production of bituminous coal, measured in tons, and the State depends largely upon coal mining for its prosperity; but the degree of such prosperity is in no sense commensurate with the quantity of coal which is mined.

Practically all wealth has its origin in natural resources; but value accrues only through human effort which recovers the so-called natural raw materials and by a process of manufacture converts them into finished products. As this process proceeds from stage to stage, value increases according to the labor and capital employed. Where labor or capital is employed it must be recompensed and thus, as the commodity increases in value, it leaves in the community where labor or capital is used a purchasing power more or less commensurate with the values which were created. The economic conditions thus produced are the basis of prosperity.

As a basic principle, therefore, underlying a sound economic development of the State, these natural resources should be utilized to a greater extent within the State. This is also in conformity with sound economic principles for the manufacture and marketing of products. It is often stated that it costs more to transport West Virginia coal to market than it costs to buy the coal from the mine operator. Coal means power and where can power be generated more economically than in West Virginia where the coal mines are in close proximity to vast resources of water power.—

(Continued on page 242)

# WHICH?

## POND SUCKER



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## **West Virginia**

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most of it as yet undeveloped? For the utilization of power, raw materials are needed and where is there such a vast store house of timber and minerals such as silica sand, limestone, clay, brines, coal, oil, gas, etc.? There are 117 distinct and separate seams of coal in the State. At present, those that are mined are all more or less in competition with each other in a market which knows coal primarily as a source of heat and power. Yet each of these coals possesses different elements of composition, has different characteristics, and is adapted to different uses. Some of them are too valuable to be used for steam and some of them should be used for local purposes instead of being thrown in open competition with others which at the moment are more economically situated for marketing. Eventually all the coals will find a profitable market, either as solid fuel; in the form of manufactured gas; or as products manufactured from the mineral.

Only within the present generation has there been a pronounced trend in the movement of manufacturing enterprises to the State. The glass industry attracted by natural gas and local deposits of glass sand moved in about the beginning of the present century. At that time the knitting and woolen mills were being established in the Eastern Panhandle where they found abundant labor and cheap living conditions. Local enterprise founded factories in Charleston, Huntington, Parkersburg and Wheeling for the manufacture of metal products where cheap power was a fac-

tor. The viscose industry located in Parkersburg because of the favorable water resources and labor conditions. Many other industries might be mentioned. The greatest expansion in local industry occurred within the last two decades due largely to the growth of the chemical plants in the Kanawha Valley.

In view of the present day trend to eliminate unnecessary transportation costs in the assembly, manufacture and marketing of manufactured articles, West Virginia is in a very favorable strategic position for future development, because:

1. It is the source of many raw products needed in industry.
2. It has an abundance of power obtainable from coal, gas and water.
3. It is within a day's journey by rail or automobile to more than half the nation's population.
4. Its transportation facilities are well developed.
5. Its climate is moderate,—free from excessive heat or cold.
6. Its abundant rainfall, climatic conditions and its elevation offer ideal living conditions.
7. It is a State of scenic beauty.

Upon the proper use of these resources will depend the future economic development of the State.

*The Interwoven Stocking Company, known the world over for its products, has four of its five mills located in the South—at Morristown, Tenn., Hagerstown, Md., Berkeley Springs and (pictured here) Martinsburg, W. Va.*



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